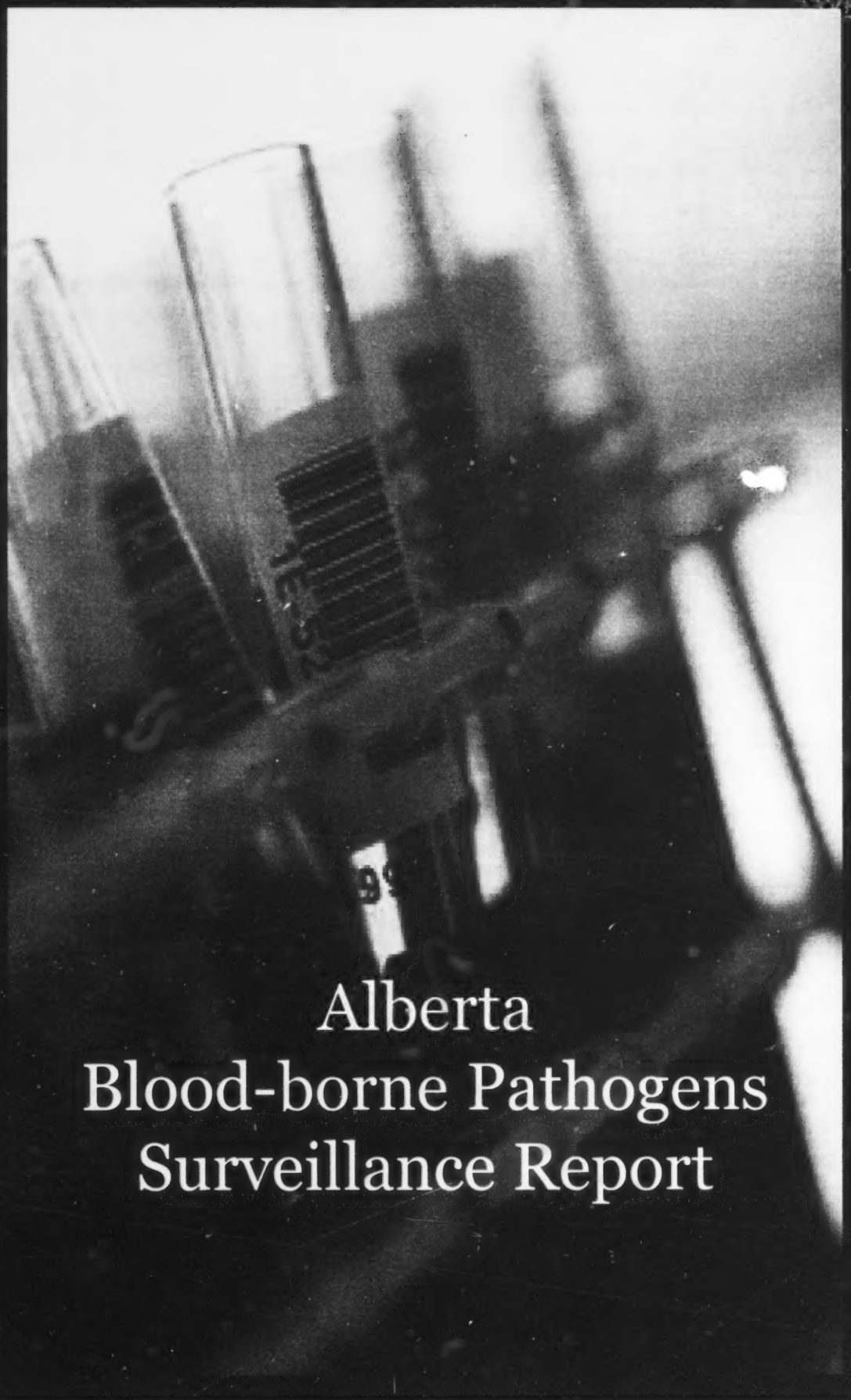

Alberta Blood-borne Pathogens Surveillance Report

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HEALTH AND WELLNESS

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Table of Contents

LIST OF TABLES IV

LIST OF FIGURES VI

GLOSSARY 1

HIGHLIGHTS 5

INTRODUCTION 9

1 BACKGROUND 9
2 METHODOLOGY 11
2.1 DATA SOURCES 11
2.2 REPORTING PROCESS 12
2.3 DATA EXTRACTION, CLEANING AND LINKAGE 13
2.4 DATA ANALYSIS 14
2.5 DATA LIMITATIONS 15

HIV/AIDS 19

1 BACKGROUND 19
2 INTERNATIONAL AND NATIONAL DATA 21
3 ALBERTA DATA 23
3.1 HIGHLIGHTS 23
3.2 DETAILS 24
3.2.1 HIV 2001 Cases 24
3.2.2 AIDS Time Trends 25
3.2.3 HIV Age Effects 26
3.2.4 AIDS Age Effects 27
3.2.5 HIV Geographic Effects 28
3.2.6 AIDS Geographic Effects 29
3.2.7 HIV Exposure Category 30
3.2.8 AIDS Exposure Category 31
3.2.9 HIV Exposure Category by Geographic Area 32
3.2.10 AIDS Exposure Category by Geographic Area 33
3.2.11 HIV Ethnicity by Geographic Area 34
3.2.12 Prenatal Screening for HIV 36
3.2.13 Deaths among Reported AIDS Cases 37

HCV 39

1 BACKGROUND 39
2 INTERNATIONAL AND NATIONAL DATA 40
3 ALBERTA DATA 41
3.1 HIGHLIGHTS 41
3.2 DETAILS 42
3.2.1 Time Trends 42
3.2.2 Age Effects 43
3.2.3 Geographic Effects 44
3.2.4 First Nations Status 45
3.2.5 Deaths due to Hepatitis C 47

ACUTE HBV 49

1 BACKGROUND 49
2 INTERNATIONAL AND NATIONAL DATA 51
3 ALBERTA DATA 52
3.1 HIGHLIGHTS 52
3.2 DETAILS 53
3.2.1 Time Trends 53
3.2.2 Age Effects 54
3.2.3 Geographic Effects 55
3.2.4 First Nations Status 56
3.2.5 Prenatal Screening for HBV 57
3.2.6 Deaths Due to Hepatitis B 58

CO-INFECTIONS 59

1 BACKGROUND 59
2 INTERNATIONAL AND NATIONAL DATA 60
3 ALBERTA DATA 61
3.1 HIGHLIGHTS 61
3.2 DETAILS 62
3.2.1 Co-infections by Year 62
3.2.2 HIV/AIDS with HCV, by Exposure Category 63
3.2.3 Co-Infections by Aboriginal/First Nations Status 64

SUMMARY 65

REFERENCES 69

APPENDIX I: MAP OF GEOGRAPHIC AREAS 73

APPENDIX II: DISEASE REPORTING FORMS 75

1 HIV/AIDS CASE REPORT FORM 75
2 NOTIFIABLE DISEASE REPORT FORM 77

APPENDIX III: CASE DEFINITIONS 79

1 HIV 79
2 AIDS 80
3 HCV 81
4 ACUTE HBV 82
5 CHRONIC HBV 83

APPENDIX IV: CODING OF HCV, HBV, AND CHRONIC LIVER DISEASE 85

APPENDIX V: TABLES 87

List of Tables

Table 1. Missing Data (Percent) for HIV, AIDS, HCV, and Acute HBV Infections
Table 2. Rate of Newly Reported HIV Infections by Sex, Alberta, 1998-2001
Table 3. Rate of Newly Reported AIDS Cases by Sex, Alberta, 1986-2001
Table 4. Age-Specific Rate of Newly Reported HIV Infections by Sex, Alberta, 1998*-2001
Table 5. Age-Specific Rate of Newly Reported AIDS Cases by Sex, Alberta, 1986-2001
Table 6. Rate of Newly Reported HIV Infections by Sex and Geographic Area, Alberta, 1999-2001
Table 7. Rate of Newly Reported AIDS Cases by Sex and Geographic Area, Alberta, 1999-2001
Table 8. Newly Reported HIV Infections by Sex and Exposure Category and Year of Reporting, Alberta, 1998*-2001
Table 9. Newly Reported AIDS Cases by Sex and Exposure Category, Alberta, 1986-2001
Table 10. Newly Reported HIV Infections by Geographic Area and Exposure Category, Alberta, 1998*-2001
Table 11. Newly Reported AIDS Cases by Geographic Area and Exposure Category, Alberta, 1986-2001
Table 12. Newly Reported HIV Infections by Geographic Area and Ethnicity, Alberta, 1998*-2001
Table 13. Percent of Women Receiving Prenatal Care Who Were Tested or Who Declined Testing for HIV Infection, and HIV Infections, Alberta, Sep. 1998 - Aug. 2002
Table 14. Number of Deaths from AIDS, Death in First Year after Diagnosis, and Age at Death, by Year, Alberta, 1986-2001
Table 15. Rate of Newly Reported HCV Infections by Sex, Alberta, 1998-2001
Table 16. Age-Specific Rate of Newly Reported HCV Infections by Sex, Alberta, 1998-2001
Table 17. Rate of Newly Reported HCV Infections by Sex and Geographic Area, Alberta, 1999-2001
Table 18. Rate of Newly Reported HCV Infections by Sex, Year of Reporting, and First Nations Status, Alberta, 1998-2001
Table 19. Rate of Newly Reported Acute HBV Infections by Sex, Alberta, 1986-2001
Table 20. Age-Specific Rate of Newly Reported Acute HBV Infections by Sex, Alberta, 1986-2001
Table 21. Rate of Newly Reported Acute HBV Infections by Sex and Geographic Area, Alberta, 1999-2001

Table 22. Rate of Newly Reported Acute HBV Infections by Sex and First Nations Status, Alberta, 1998-2001
Table 23. Number and Proportion of Pregnant Women Who Were Tested for Hepatitis B Surface Antigen, and Hepatitis B Infections in Alberta, Sep. 1998 - Aug. 2002
Table 24. Co-Infections in Newly Reported HIV/AIDS, HCV, and Acute HBV Infections by Year of Reporting, Alberta, 1998*-2001
Table 25. Newly Reported HIV/AIDS cases with HCV Co-Infection by Exposure Category, Alberta, 1998*-2001
Table 26. Co-Infections in Newly Reported HIV/AIDS, HCV, and Acute HBV Infections by Aboriginal Ethnicity/First Nations, Alberta, 1998*- 2001

List of Figures

Age-Adjusted Rate of Newly Reported AIDS Cases by Sex, Alberta, 1986-2001 25
Age-Specific Rate of Newly Reported HIV Infections by Sex, Alberta, 1998*-2001 26
Age-Specific Rate of Newly Reported AIDS Cases by Sex, Alberta, 1986-2001 27
Age-Adjusted Rate of Newly Reported HIV Infections by Sex and Geographic Area, Alberta, 1999-2001 28
Age-Adjusted Rate of Newly Reported Male AIDS Cases by Geographic Area, Alberta, 1999-2001 29
Percent of Newly Reported HIV Infections by Sex and Exposure Category, Alberta, 1998*-2001 30
Percent of Newly Reported AIDS Cases by Sex and Exposure Category, Alberta, 1986-2001 31
Percent of Newly Reported HIV Infections by Geographic Area and Exposure Category, Alberta, 1998*-2001 32
Percent of Newly Reported AIDS Cases by Geographic Area and Exposure Category, Alberta, 1986-2001 33
Percent of Newly Reported HIV Infections by Geographic Area and Ethnicity, Alberta, 1998*-2001 34
Percent of Women Receiving Prenatal Care Who Were Tested for HIV Infection, Alberta, Sep 1998 - Aug 2002 36
Percent of Deaths in First Year after Diagnosis for Newly Reported AIDS Cases, Alberta, 1986-2001 37
Age-Adjusted Rate of Newly Reported HCV Infections by Sex, Alberta, 1998-2001 42
Age-Specific Rate of Newly Reported HCV Infections by Sex, Alberta, 1998-2001 43
Age-Adjusted Rate of Newly Reported HCV Infections by Sex and Geographic Area, Alberta, 1999-2001 44
Age-Adjusted Rate of Newly Reported HCV Infections by Sex and First Nations Status, 1998-2001 45
Age-Adjusted Rate of Newly Reported Acute HBV Infections by Sex, Alberta, 1986-2001 53
Age-Specific Rate of Newly Reported Acute HBV Infections by Sex, Alberta, 1986-2001 54
Age-Adjusted Rate of Newly Reported Acute HBV Infections by Sex and Geographic Area, Alberta, 1999-2001 55
Age-Adjusted Rate of Newly Reported Acute HBV Infections by Sex and First Nations Status, Alberta, 1998-2001 56
Percent of Women Receiving Prenatal Care Who Were Tested for HBV Infection, Alberta, Sep 1998 - Aug 2002....57
Proportion of Co-Infected Persons Within Aboriginal and Non-Aboriginal Infected Populations, Alberta, 1998* - 2001....64

Glossary

Acronyms

AIDS: Acquired immune deficiency syndrome

CDRS: Communicable disease reporting system at Alberta Health and Wellness

HBV: Hepatitis B virus

HCV: Hepatitis C virus

HAART: Highly active anti-retroviral therapy

HIV: Human immunodeficiency virus

NDR: Notifiable disease report

PHN: Personal health number

RHA: Regional health authority

Terms

Hepatitis B: The infection caused by the hepatitis B virus.

Hepatitis C: The infection caused by the hepatitis C virus.

Newly reported cases: Cases tested for infection and reported to the CDRS for the first time. Cases that have yet to be diagnosed (i.e., that have not been tested) or have yet to be reported are excluded, as are cases that have previously been reported. Thus, newly reported cases do not represent the true incidence of infection (newly infected each year) or prevalence of infection (total number of people living with the infection) in the population.

Rate of newly reported cases: Number of newly reported cases of a given infection per 100,000 population in a given time period.

Confidence intervals: Statistical estimates are uncertain; the reported result of a statistical analysis is the most likely result. "A confidence interval is an estimate of the spread between the lowest likely result (lower confidence limit) and the highest likely result (upper confidence limit) of a study. The true result of the study probably lies somewhere within this confidence interval."[1]

In this report, confidence intervals provide a range of values with 95% certainty.

Age-adjusted rate of newly reported cases: To allow valid comparisons across geographic areas or over time between populations, the age/sex compositions of the populations need to be the same. In this report, the rates of newly reported cases were adjusted by the age distribution of the 1996 Canadian census. That is, the age distributions were statistically equalized for the relevant populations for a given geographic area and/or time period. The resulting age-adjusted rates are useful for comparisons across geographic areas or over time but may not necessarily reflect the actual magnitude of the disease in a given geographic area or time period. Standard errors and 95% confidence intervals of age-adjusted rates were estimated according to the method of Carriere and Roos.[7]

Rate ratio: The ratio of one rate to another. For example, a rate of 40 per 100,000 population in one group versus a rate of 10 per 100,000 results in a rate ratio of 4 to 1 (the rate in the first population is 4 times that in the second population).

Age at reporting: Age of patient on the date the case was reported to CDRS. This is the age used in data analyses reported here, and represents an underestimation of age at diagnosis (age of patient on the date the case was diagnosed), due to reporting delay.

Geographic area: Four geographic areas in the province were defined according to reported residence by RHA (2001 boundaries). Southern Alberta includes residents of RHAs 1, 2, 3, 5, and 6; Calgary area includes residents of RHA 4, Edmonton area includes residents of RHA 10, and Northern Alberta includes residents of RHAs 7 through 9 and 11 through 17 (see map in Appendix I).

Exposure categories: Risk factors that reported HIV/AIDS cases were exposed to. Exposure categories were created from categories on the Health Canada case report form for HIV/AIDS (see form in Appendix II). Exposure categories used in our analyses include:

- *MSM* (men who have had sex with men)
- *IDU* (injection drug user of non-prescription drugs)
- *MSM-IDU* (men who have had sex with men *and* have injected drugs)
- *Heterosexual, endemic* (heterosexual contact with a person born in a country in which the predominant means of HIV transmission is heterosexual contact)

Heterosexual, other (combined category: heterosexual contact with a person known to be HIV-infected or at increased risk for HIV infection, or heterosexual contact with a person with unknown risk factors)

Blood/clotting factor (combined category: receipt of whole blood or blood components, or receipt of clotting factor for treatment of hemophilia/coagulation disorder)

Occupational (exposure in an occupational setting)

Other (combined category: other medical or non-medical exposure in a non-occupational setting)

Mother-to-child/pediatric (combined category: transmission of HIV from an HIV-infected mother to her child during pregnancy, labour, or birth, or through breastfeeding; or other transmission to a person aged 15 or younger)

Unknown (combined category: no identified risk factors (NIR), or source of exposure completely unknown)

Ethnicity (HIV/AIDS analyses)

Ethnicity as reported on the Health Canada case report form for HIV/AIDS (see Appendix H). Categories include Caucasian, African-Canadian, Aboriginal (American Indian, Métis, or Inuit), Asian (Asian, South Asian, and Arab/West Asian), Latin-American, and Other (including mixed ethnicity).

First Nations status (HCV and HBV analyses)

Data on First Nations status were extracted from the Alberta Health Care Insurance Plan Registry (see Data Sources and Data Extraction, Cleaning and Linkage sections). Persons having First Nations status in the Alberta Health Care Insurance Plan Registry are those that are registered under the Indian Act[3] or are recognized as Inuit or Innu and as such have their Alberta health care premiums paid by the federal government. Note that this category excludes Métis persons, unlike the Aboriginal ethnicity category used for the HIV/AIDS analyses.

Co-Infection

Co-infection is defined as infection with two or more blood-borne pathogens at the same time. For example, many persons infected with HIV are co-infected with HCV.

Highlights

This report contains data on selected blood-borne pathogen infections in Alberta. Pathogens studied include HIV (Human Immunodeficiency Virus), HCV (hepatitis C virus), and HBV (hepatitis B virus; we report only acute HBV infections with the exception of HBV prenatal screening data, which include both acute and chronic cases). Measures are based on newly reported cases of infection per year, up to 2001.

For each of the pathogens and for AIDS, background information is provided on the effects of the virus, modes of transmission, available treatments, and international and Canadian data on infection rates. Our analyses of Alberta data examine time trends, age, geographic area, ethnicity, exposure categories (HIV/AIDS), deaths, and prenatal screening.

HIV data are for May 1998 to December 2001. AIDS data are for 1986 to 2001.

HIV and AIDS

HIV has been reportable since May 1998 and AIDS has been reportable since 1983. The number of newly reported AIDS cases has been declining in recent years, partially due to the introduction of effective HIV/AIDS treatments. Infection rates were higher in larger urban centres than in other areas.

The age-adjusted rate of newly reported cases of HIV infection was 5.7 (per 100,000 population) in 2001. The 2001 AIDS rate of newly reported cases was 1.4 and has been decreasing since 1995.

The rate of newly reported cases for both HIV and AIDS was higher in males than in females. There were more than twice as many male HIV infections as female between 1998 and 2001. The ratio is substantially higher for AIDS cases.

Mean age at reporting for HIV cases between 1998 and 2001 was 35.9 years. The mean age for male AIDS cases increased over time, from 38.4 in 1986 to 42.3 years in 2001.

The rate of newly reported cases of HIV was highest in the Edmonton and Calgary areas for 1999 to 2001 (9.1 and 5.9 per 100,000, respectively). The AIDS rate was highest in the Calgary area (2.6 per 100,000) during the same time period.

The most commonly reported exposure categories for men with HIV infection were injection drug user (35.2% of cases) and men who have sex with men (34.8%). For females, the most frequent exposure categories were injection drug user (52.8%) and heterosexual contact (other) (27.9%). For AIDS from 1986 to 2001, men who have sex with men was the leading exposure category for males (80.0% of cases), and heterosexual contact (other) (48.4%) and injection drug user (29.7%) were highest frequency for females.

Exposure category patterns varied significantly across the geographic areas of the province. For example, injection drug use predominated in the Edmonton area, while men who have sex with men was the most common exposure category in the Calgary area.

The proportion of HIV infections contracted by Aboriginal persons was high, ranging from 12.9% of newly reported infections in the Calgary area to 58.9% in Northern Alberta.

94.9% of pregnant women who accessed prenatal care in Alberta between September 1998 and August 2002 were tested for HIV. The HIV rate among these women was 0.48 (per 1,000 live births).

There were 11 AIDS deaths in Alberta in 2001, compared with the peak of 95 deaths in 1994. The adjusted mean age at death for AIDS cases was 32.2 in 1986 and 44.7 in 2001.

HCV

HCV data are for 1998 to 2001.

HCV has been reportable in Alberta since 1996. HCV is much more common than HIV, and is spread easily by infected needles during injection drug use. HCV infections occurred in all age groups, but were most common between 25 and 54 years of age. Males, First Nations individuals, and residents of Edmonton were at increased risk of HCV infection.

There is a declining trend in the age-adjusted rate of newly reported cases of HCV infection. The 2001 rate was 71.2 (per 100,000 population), compared with 102.0 in 1998.

The ratio of male to female newly reported cases of HCV between 1998 and 2001 was 1.8:1.

The mean age for newly reported cases of HCV from 1998 to 2001 was 40.8 years.

HCV rates were highest in the Edmonton area (113.6 per 100,000 population for 1999 to 2001).

The First Nations age-adjusted rate of newly reported cases of HCV was 325.3 (per 100,000 population). The non-First Nations rate was 69.3.

There were 57 deaths reported as caused by hepatitis C from 1998 to 2001, and a further 402 chronic liver disease deaths estimated to be caused by hepatitis C, for a total of 459 hepatitis C deaths.

Acute HBV

Acute HBV has been reportable in Alberta since 1977. Unlike HIV and HCV infection, HBV infection is preventable by vaccination. School-based immunization programs are in effect in Alberta, and the rate of newly reported cases of acute HBV is declining. Males and First Nations individuals had elevated rates of acute HBV infection. Female acute HBV cases tended to be younger than male cases.

The age-adjusted rate of newly reported acute HBV infections declined from 1986 to 2001; the 2001 rate was 3.0 (per 100,000).

The ratio of male to female newly reported cases of acute HBV was 1.8:1.

The mean age for newly reported cases of acute HBV was 33.1 years.

There were no significant differences in acute HBV rates in the four regions of the province.

The age-adjusted rate of newly reported cases of acute HBV for First Nations cases was 8.2 (per 100,000 population). The rate for non-First nations cases was 2.5.

Of all women who accessed prenatal care in Alberta, 99.9% were tested for HBV by 2002. The rate of hepatitis B surface antigen positive in this population was 5.3 (per 1,000 live births) from August 1998 to September 2002.

There were 69 deaths reported as caused by hepatitis B from 1986 to 2001, and a further 466 chronic liver disease deaths estimated to be caused by hepatitis B, for a total of 535 hepatitis B deaths.

Co-infection data are for 1998 to 2001.

Co-infections

Co-infections can alter the course of a disease and change the effect of treatments. Co-infections of blood-borne pathogens are to be expected, due to similarities in modes of transmission. Injection drug use is a common source of co-infection. Aboriginal/First Nations individuals make up a large proportion of co-infected cases.

19.7% of HIV/AIDS cases newly reported between 1998 and 2001 were co-infected with HCV. Injection drug users made up 86.0% of this group, but only 30.3% of the HIV/AIDS cases *not* co-infected with HCV were injection drug users.

1.1% of HCV cases newly reported between 1998 and 2001 were co-infected with HIV/AIDS.

21.9% of acute HBV cases newly reported between 1998 and 2001 were co-infected with HCV.

35.9% of Aboriginal HIV cases were co-infected with HCV, compared with 15.4% of non-Aboriginal cases. The rate of co-infection of HCV with HIV/AIDS was 5.9% in First Nations persons, and 0.9% in non-First Nations individuals. 50.0% of First Nations acute HBV cases were co-infected with HCV, compared with 20.9% of non-First Nations cases.

Introduction

1 *Background*

Communicable diseases have been prevalent health care topics in recent years, resulting in challenges for professionals in diverse elements of health care planning, provision, and surveillance. The blood-borne pathogen infections reported on here have potentially severe or even fatal outcomes, and as such the health and economic impact of these pathogens looms large. This report originated with the recognition of a need for timely, comprehensive data on blood-borne pathogen infections in Alberta.

Our goal was to provide high quality reporting of current trends in blood-borne pathogen infections in Alberta. We focus on three common blood-borne pathogens: Human Immunodeficiency Virus (HIV), hepatitis C virus (HCV), and acute infection with hepatitis B virus (HBV). It is our hope that this information will prove valuable to policy makers, program planners, researchers, practitioners, and the general public alike.

We present epidemiological data and provide some description of the results of our analyses. Our methodology involved a literature review of international and national data, coupled with analysis of pertinent Alberta data.

We looked at effects of time, age, geographic area, ethnicity/ aboriginal status, and exposure category (for HIV/AIDS)

Individual sections for each of the pathogens (HIV/AIDS, HCV, and HBV) are included. Each section begins with background information on the effects of the virus, the modes of transmission, available treatments, and international and Canadian data on infection rates. Alberta data follow, including time trends, effects of age, geographic area, ethnicity, and exposure category (for HIV/AIDS), and other analyses as appropriate. Data tables are provided in Appendix V.

This report will be updated periodically. A separate document on Alberta blood-borne pathogens strategy for HIV, HCV, HBV, and sexually transmitted infections is forthcoming.

The Surveillance Task Group of the Non-Prescription Needle Use (NPNU) project instigated this report through a recommendation to the NPNU Consortium to produce a surveillance report on diseases caused by blood-borne pathogens. The recommendation was ratified by the NPNU Consortium and endorsed by the Ministry of Health and Wellness. The Population Health Division at Alberta Health and Wellness was charged with the responsibility of producing the report. The NPNU Surveillance Task Group played an advisory role by providing input and reviews of draft reports.

2 *Methodology*

2.1 Data Sources

Communicable Disease Reporting System (CDRS)
Communicable disease case reports are centrally collected and maintained in the CDRS, which is a secure database managed by the Disease Control and Prevention Branch of Alberta Health and Wellness. Positively confirmed laboratory reports are required to complete each notifiable disease record. Laboratory reports are submitted directly from the Provincial Laboratory for Public Health or the Medical Officer of Health to the Disease Control and Prevention Branch. A case only becomes counted in the CDRS upon receipt of both a confirmatory laboratory report and a Notifiable Disease Report (NDR).

Canadian Blood Services Prenatal Screening Database
Screening for HIV in pregnant women is now accepted as the standard of care. During routine prenatal care in Alberta, blood samples from pregnant women are sent to the Canadian Blood Services Laboratories in Edmonton and Calgary, where they are tested for blood typing and Rh factors, HBV, rubella, and syphilis. Sera are also screened for HIV infection if the Canadian Blood Services Perinatal Order Form is properly completed and accompanies the specimen to the laboratory. Women have the option to decline testing.

Confirmatory HIV and HBV testing is conducted at the Provincial Laboratory for Public Health. Blood samples screened for HIV and/or HBV infection and those confirmed positive for HIV and/or HBV in Alberta between September 1, 1998 and August 31, 2002 were extracted from the Canadian Blood Services prenatal screening database for the current report.

Alberta Health Care Insurance Plan Registry
The Alberta Health Care Insurance Plan Registry was established to enable premium collection and assessment of registrant eligibility for services claimed by medical practitioners. The current report used demographic information from this database. The Alberta Stakeholder Registry Population Files are derived from the Alberta Health Care Insurance Plan Registry and were used to estimate the population of the province and its regions. Information on First Nations status was also obtained from the Alberta Stakeholder Registry Population Files.

2.2 Reporting Process

In order to detect disease outbreak and prevent further spread of disease, physicians, regional health authorities, and laboratories are required by the Communicable Diseases Regulation of the *Public Health Act of Alberta* to report to public health officials the occurrence of certain communicable diseases.

All cases of HIV/AIDS, HCV and acute HBV are notifiable diseases and are to be reported by the Regional Medical Officer of Health to Alberta Health and Wellness. Specifically, client data for HIV/AIDS are reported to Alberta Health and Wellness on the Health Canada HIV/AIDS case report form (see form in Appendix II). HCV and acute HBV cases are reported on the standard NDR form (see Appendix II).

Blood-borne pathogen cases are confirmed by laboratory tests. When a test is positive, the lab notifies Alberta Health (resulting in the information being entered into the CDRS) and the RHA. A community health nurse follows up with the infected person and contacts those at risk. The community health nurse completes the required documentation, which is submitted by the RHA, or for cases from Indian reserves, the First Nations and Inuit Health Branch of Health Canada, to Alberta Health and Wellness.

In Canada the jurisdiction (that is, the province or territory) of residence at the time of the HIV/AIDS diagnosis reports the case. However, for all other notifiable diseases including HCV and HBV, it is the jurisdiction at the time of infection that reports the disease.

HBV became reportable in Alberta in 1977, AIDS in 1983, HCV in 1996 and HIV in May 1998.

In Alberta, AIDS became reportable in 1983, acute HBV in 1977, and HCV (formerly known and reported as hepatitis non-A non-B) in 1996. HIV was added to the list of notifiable diseases in Alberta and became reportable in May 1998. In 1998, HIV was notifiable in all Canadian jurisdictions except Quebec and British Columbia. Quebec made HIV notifiable in 2002, and British Columbia followed suit in May 2003. Because reporting is based on jurisdiction of residence, differences in notifiability across jurisdictions may have resulted in some missing cases.

Another possible source of under-reporting stems from Immigration Canada practices. Refugees and immigrants applying for entry into Canada on humanitarian grounds who are identified as HIV positive through medical screening are currently not required to be reported to provincial authorities as HIV positive.

2.3 Data Extraction, Cleaning and Linkage

HIV and **AIDS** data were extracted from the HIV/AIDS section of the CDRS database. Only notifiable disease records with NDR hard copies (see form in Appendix II) received from RHAs were included. The data sets were checked for duplication by using registration numbers, Personal Health Numbers (PHNs) and other demographic information. No duplicate records were found.

HCV and **Acute HBV** data were derived from two databases. The first database is an older version of the Notifiable Disease Records database (NDR_OLD) that contains data from 1985 to July 1998. The second is the (newer) CDRS database that contains records from August 1998 to 2001. Duplication of records was checked using NDR numbers, PHNs, and demographic information. All duplicated records were removed: 3 for HBV infection and 164 for HCV infection. Most of the duplicated records for HCV occurred in 1997 and 1998 data.

Data linkage: First Nations status

Ethnicity data for HCV and acute HBV were rather incomplete. For this reason, a linkage between HCV and acute HBV data sets and the Alberta Health Care Insurance Plan Registry was performed to obtain information on First Nations status. The linkage process involved the following two approaches:

- 83.9% of HCV records and 26.0% of acute HBV records had information on PHN. For these records, PHN was used for direct linkage.
- For records with missing PHN, deterministic linkage was performed using first and last name, date of birth and sex.
- The final linkage rate was 97.3%.

Data linkage: Co-infection

The record linkage process for co-infection of HIV, AIDS, HCV, and acute HBV was as follows:

- Step one: Link HIV and AIDS records by names, date of birth and sex, or by PHN.
- Step two: Link HCV and HBV records by names, date of birth and sex, or by PHN.
- Step three: Link the two results from step one and two by names, date of birth and sex, or by PHN.

2.4 Data Analysis

Data completeness and availability dictated that infections be analyzed for the following time periods:
HIV: May 1998 to December 2001
AIDS: January 1986 to December 2001
HCV: January 1998 to December 2001
HBV: January 1986 to December 2001

In order to increase reliability, *rates* for geographic areas are typically calculated for three-year periods (1999 to 2001 combined in this report). *Proportions* of cases per geographic area were calculated for 1998 to 2001, using all four years of available data.

Prenatal testing data for HIV and HBV were available from September 1998 to August 2002.

All reported cases of HIV, AIDS, HCV, and acute HBV were categorized by year, sex, age group, geographic area, ethnicity, and exposure category (for HIV/AIDS), as appropriate (see Glossary).

Analyses included calculation of proportions (percentages), means, rates of newly reported cases (per 100,000 population), and age-adjusted rates of newly reported cases (per 100,000 population), as appropriate.

Chi-square tests, linear trend tests, and analyses of variance were applied, as appropriate, for comparisons.

Data analysis was performed using SAS 6.12. Tables were generated in Microsoft Excel and figures were generated in DeltaGraph 5.

2.5 Data Limitations

Data appearing in this report are subject to a number of limitations, and all readers are encouraged to consider this section carefully.

Newly reported cases

Our data are based on newly reported cases. Not all infected persons are tested or reported for various reasons, including fear of learning positive results, complacency, lack of follow-up, etc. Asymptomatic cases are especially likely to be underdiagnosed. There may be underreporting of AIDS cases previously reported as HIV cases. Cases that were diagnosed before infections were reportable (and that were not reported at a later date) are not included.

Newly reported cases do not reflect incidence or prevalence of disease in the population. Because HIV and HCV became reportable only in 1998 and 1996, respectively, some cases diagnosed before those dates were not reported. Some of the burden of disease for HIV and HCV is thus not represented in our data.

Missing data

Table 1 (in Appendix V) provides the percentage of cases with missing data on the variables appearing in this report, as well as on the demographic variables used to link databases, for each pathogen/syndrome. Data based on variables with large amounts of missing data should be interpreted with caution, as they may not be representative of the population being described.

Small numbers of cases

In many cases, especially when data were stratified by sex, age, geographic area, ethnicity/Aboriginal ethnicity/First Nations status, or exposure category, categories contained small numbers of cases. Caution must be taken in interpretation of these numbers, as they may not be reliable. Some rates were not reported nor comparisons made due to concerns about reliability.

First Nations status

Data on ethnicity were incomplete for HCV and acute HBV. In order to determine First Nations status for HCV and acute HBV infections, data from the Communicable Disease Registry System were linked to data in Alberta Health Care Insurance Plan Registry. Not all cases could be linked (see Data Extraction, Clearing and Linkage section). It must also be stressed that this population does not include all Aboriginal persons. Furthermore, the First Nations indicator in the Alberta Health Care Insurance Plan Registry is not a perfect measure of status as a First Nations individual; some First Nations individuals may not be recorded as such, and some non-First Nations individuals may be classified as First Nations.

Anonymous reporting
For HIV/AIDS data, anonymous HIV testing and case reporting is an option available to clients, though this option is exercised much less frequently than in the early days of the HIV/AIDS epidemic. This anonymity limited our ability to perform data linkage.

Reporting delay
For almost all cases reported to CDRS, there was a delay between reporting date (the date that Alberta Health and Wellness received the NDR) and diagnosis date (the date of physician diagnosis, from the NDR). There are lags involved in presentation of the client to the health care provider, laboratory confirmation, client follow-up, and completion of case reports. Loss of clients to follow-up represents another important limitation. Clients may be tested and found to be positive but fail to return for follow-up care and treatment. This is particularly problematic in the case of transient and homeless clients.

We used reporting date to classify cases according to year, due to incomplete data on diagnosis date and date of infection. For cases with both diagnosis and reporting date available, we calculated reporting delay range, median yearly reporting delay ranges, and percent of cases reported more than 90 days after diagnosis; see table below. Acute HBV reporting delays were only calculated for 1998 to 2001, as diagnosis dates were not collected prior to 1998 for HBV.

Pathogen/ Syndrome	Years	Reporting delay range (days)	Median yearly reporting delay range (days)	% of cases with reporting delay >90 days
HIV	1998 - 2001	0 - 789	30 - 51	16.3
AIDS	1986 - 2001	0 - 4786	28 - 78	23.3
HCV	1998 - 2001	0 - 5110	0 - 14	6.1
Acute HBV	1998 - 2001	0 - 10425	9 - 25	5.5

Case definitions
Case definitions evolve over time, and there is resulting variability in diagnosis of diseases. All blood-borne pathogen cases are diagnosed by clinical assessment and serological testing. Case definitions for HIV, AIDS, HCV and HBV, published by Health Canada in 2000, are found in Appendix III. New case definitions for HCV and acute HBV are being developed by Alberta Health and Wellness, and will take effect in the near future. Note that testing algorithms for acute HBV may vary slightly from the case definition across regions.

Deaths
Deaths reported here include only those that were *caused by* the pathogen/syndrome in question. HIV, AIDS, HCV and HBV likely *contributed to* more deaths than are reported here.

Previously published data
Data in this report may differ from that previously published due to differences in methodology and/or dates of data extraction.

HIV/AIDS

1 *Background*

HIV, first identified in 1983, attacks the immune system and destroys lymphocytes, rendering patients susceptible to opportunistic infections and tumours. Seroconversion occurs at 4 to 8 weeks after initial infection for 75% of people, and within 14 weeks almost all people produce antibodies.[4] About half of newly infected individuals are asymptomatic and the other half may experience symptoms such as fever, headache, and lymphoadenopathy[5]. Following initial infection without treatment, the chronic stage of HIV infection may last 7 to 11 years with no clinical symptoms or very mild illnesses.[6]

The final stage of HIV infection is the development of AIDS. AIDS as a distinct syndrome was first recognized in 1981 and is defined by onset of specified opportunistic diseases in the presence of HIV infection[7]. These diseases include (but are not limited to) pneumocystis carinii pneumonia, esophageal candidiasis and Kaposi's sarcoma.

For detailed case definitions of HIV and AIDS, see Appendix III.

HIV is transmitted through sexual contact, intravenously, or from mother to child

Transmission of HIV is mainly through three modes: sexual, parenteral (intravenous) and mother to child. Sexual transmission occurs through both heterosexual and homosexual contact. Intravenous transmission can occur through needle sharing during injection drug use, tattooing or body piercing. Most developed countries have blood supply screening and inactivation treatment of clotting factor concentrates. Transmission through blood transfusion or use of blood products has been virtually eliminated in these countries. Mother to child transmission is thought to occur during delivery or shortly after birth through breast-feeding. Transmissibility begins early after the onset of HIV infection and extends throughout life. It is believed that infectivity is high during the initial period after infection and increases with increasing immune deficiency, the presence of clinical symptoms and the presence of other sexually transmitted diseases. [5,6,8]

Anti-retroviral therapy has been an effective treatment for HIV.

There is no effective vaccine for the prevention of HIV infection. Highly active anti-retroviral therapy (HAART) is used for the treatment of HIV infection. Introduced in 1996, HAART has been effective in the prevention or delay of the onset of AIDS, thus prolonging the survival of HIV infected persons. In Alberta, post-exposure prophylaxis is offered to infants born to mothers with HIV infection, to recipients of high-risk needle stick injuries, and to sexual assault victims, after assessment under a provincial screening protocol.

Alberta has an "opt-out" prenatal screening program for HIV.

A prenatal screening program for HIV was established in Alberta in September 1998. All pregnant women who present for prenatal care are screened for HIV infection unless the women decline testing (i.e., it is an "opt-out" program). The success of this program in increasing recruitment rates has been documented.[9] The Canadian Medical Association has recommended adoption of a national "opt-out" HIV screening policy for all pregnant women.

Infected women are offered anti-retroviral treatments that significantly decrease the risk of mother-to-child transmission. Early prenatal screening is strongly recommended, as the efficacy of treatment in preventing mother-to-child transmission of HIV is greater when treatment is initiated earlier. Infants born to HIV-positive mothers are followed up after birth. Only one infant has been confirmed with HIV infection since the implementation of the HIV screening program. The mother of this infant was not screened during the prenatal period (i.e., she either opted out of screening or did not present for prenatal care) and was found to be HIV positive after giving birth.

In Alberta, confirmed cases of HIV infection and AIDS have been reportable to Disease Control and Prevention at Alberta Health and Wellness since May 1998 and 1983, respectively. Note that many HIV cases were diagnosed prior to May 1998 but not reported to the CDRS; these cases do not appear in this report. Much of the burden of HIV in Alberta is represented by these earlier cases.

2 *International and National Data*

According to joint United Nations/World Health Organization data to December 2002, 42 million people were living with HIV/AIDS, 5 million people worldwide were newly infected with HIV in 2002, and there were 3.1 million AIDS deaths in 2002 alone. There appears to be a resurging epidemic in high-income areas, including North America, parts of Europe, and Australia.[10]

Prevalence estimates indicated that 49,800 people were living with HIV in Canada in 1999. An estimated 15,000 of these cases were unaware of their positive HIV status.[11] The incidence estimate for 1999 in Canada was 4,190 new infections.[12]

New HIV cases are declining in Canada, though the proportion of female cases is increasing.

There were 2,172 positive HIV tests reported in Canada in 2001. The number of positive HIV tests showed a declining trend from 1985 to 2001. There were 221 AIDS cases in 2001. Overall, the number of reported AIDS cases is decreasing in Canada. The rate of this decrease has slowed of late, however.[13]

In 2001, 25.0% of reported adult HIV cases were female, which represents a steadily increasing trend. For both males and females the highest number of cases was reported in the 30 to 39 year old age group. In 2001, 84.3% of the reported AIDS cases were male, and the largest number of cases was reported in 30 to 49 year olds.[13]

New AIDS cases are declining in Canada. Most AIDS cases are male.

For adult males in 2001, the highest proportion of reported cases of HIV was in the exposure category of men who have sex with men (48.5% of reported cases), followed by heterosexual contact (23.1%), and injection drug use (22.4%). For adult females, heterosexual contact comprised the bulk of new infections (63.5% of reported cases), followed by injection drug users (31.6%). Amongst children reported to have positive HIV tests in 2001, 75.0% were in the category of mother-to-child transmission.[13]

Data for 2001 for adult male AIDS cases show that 53.3% of reported cases were in the men who have sex with men exposure category, followed by heterosexual contact (25.8%) and injection drug use (15.6%). For adult females, 84.8% of AIDS cases reported in 2001 fell into the heterosexual contact exposure category, and 9.1% into injection drug use. All AIDS cases reported in Canada in 2001 for children less than 15 years of age were in the mother-to-child transmission category.[13]

AIDS deaths in Canada have declined markedly since 1996.

Aboriginal persons accounted for 7.2% of reported AIDS cases for which ethnic status was available in 2001.[13]

Deaths attributed to HIV in Canada rose steadily from 1987, peaking at 1,764 deaths in 1995 (0.8% of all deaths). From 1996 on, HIV mortality declined sharply, and in 1998 there were 485 deaths due to HIV. HIV fell from the second leading cause of death among males aged 25 to 44 years in Canada in 1995 to seventh in 1998.[14]

The economic burden of HIV/AIDS in Canada is high. The Canadian Policy Research Network estimated the cost to be $36.3 billion up to 1996, including both direct costs (such as health care) and indirect costs (such as years of lost productivity). Costs are expected to increase with the increasing prevalence of HIV, and increasing survival rate due to effective treatment. It is estimated that the lifetime direct costs of treating a person living with HIV in the HAART era are $153,000, with indirect costs of up to $600,000.[15] The direct costs of medical care for HIV/AIDS patients in Southern Alberta were calculated to be $13,428 per year in 2000-2001.[16]

3 *Alberta Data*

3.1 Highlights

HIV data are for May 1998 to December 2001. AIDS data are for 1986 to 2001.

- The rate of newly reported cases of AIDS has declined substantially since 1995.
- Approximately two-thirds of newly reported HIV cases were male, and almost all newly reported AIDS cases were male.
- Men between 30 and 39 and women between 20 and 34 years of age had the highest rates of newly reported cases of HIV from 1998 to 2001. New AIDS cases were most commonly reported between the ages of 30 and 44.
- The rate of newly reported male cases of HIV infection was higher in the Edmonton and Calgary areas than in other parts of the province for 1999 to 2001. For female HIV cases the rate was higher in the Edmonton area than in the other areas of the province. The AIDS rate was elevated in the Calgary area for the same period.
- For males, the most common routes of exposure to HIV were injection drug use and sex with men. Injection drug use and heterosexual contact were the most common exposure categories for females infected with HIV. For AIDS cases, males were most commonly exposed through sex with men, while the most common exposure categories for females were heterosexual sex and injection drug use.

Analyses are based on cases reported for the first time only (newly reported cases).

- Patterns of exposure to both HIV and AIDS varied with geographic area. Most notably, men who have sex with men accounted for a larger proportion of cases in the Calgary area than in other areas of the province, while heterosexual contact (other) accounted for a proportionately larger number of cases in Northern Alberta.
- Aboriginal persons were markedly over-represented in newly reported HIV and AIDS cases.
- By 2002, nearly all pregnant women who presented for prenatal care were screened for HIV in Alberta.
- Deaths attributed to AIDS have declined dramatically since the mid-1990's.

3.2 Details

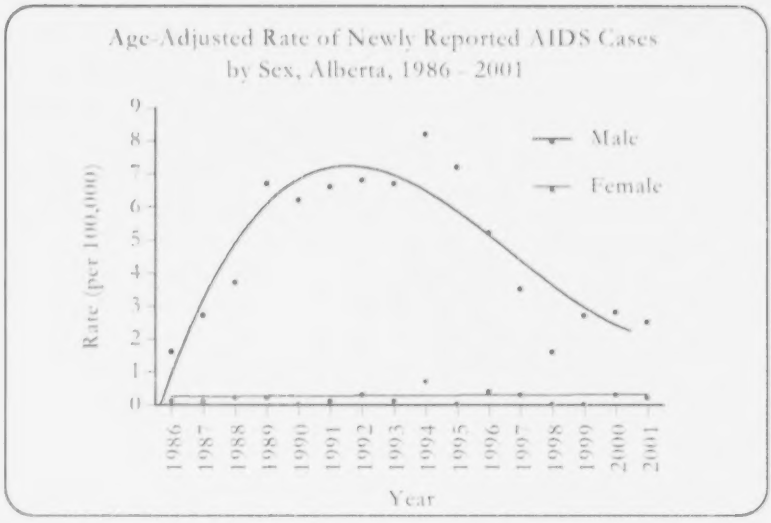
3.2.1 HIV 2001 Cases

See Table 2

- HIV data are available only from May 1998, leaving just three full years of data (1999 through 2001) and a partial year (1998). Because three data points are insufficient to determine reliable time trends, time trend data are not shown.
- There were 169 newly reported cases of HIV infection in Alberta in 2001. 123 of these (72.8%) were male.
- This translates to an age-adjusted rate of 5.7 newly reported cases per 100,000 population for 2001.

3.2.2 AIDS Time Trends

See Table 3

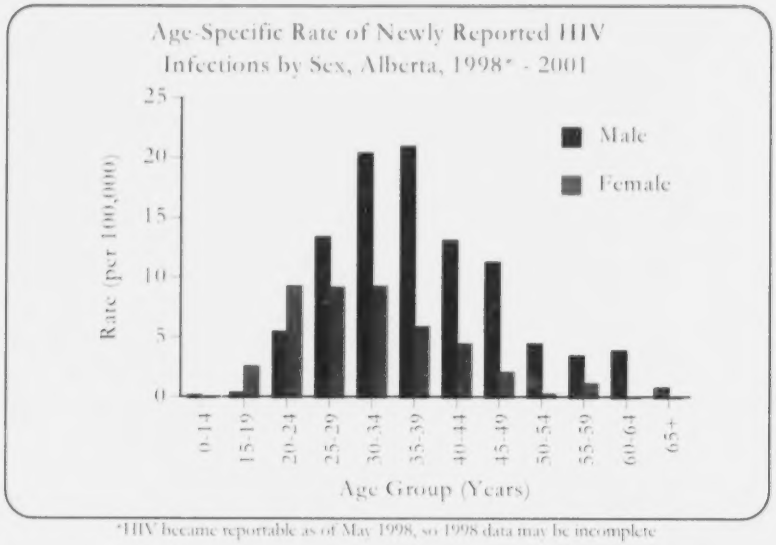


Reports of male AIDS cases have declined in recent years.

- There were 42 newly reported cases of AIDS in Alberta in 2001, for an age-adjusted rate of 1.4 newly reported cases per 100,000 population.
- In 2001, 88.1% of cases were male.
- For males, the age-adjusted rate increased from 1.7 per 100,000 in 1986 to 8.3 in 1994, then decreased thereafter to a relatively low point of 2.6 in 2001.
- For females, the rate fluctuated over time, and no time trend was found.
- HAART was introduced in 1996. The decline in number of newly reported AIDS cases since that date may partly reflect the use of this therapy that can delay the development of AIDS among HIV- infected individuals.

3.2.3 HIV Age Effects

See Table 4



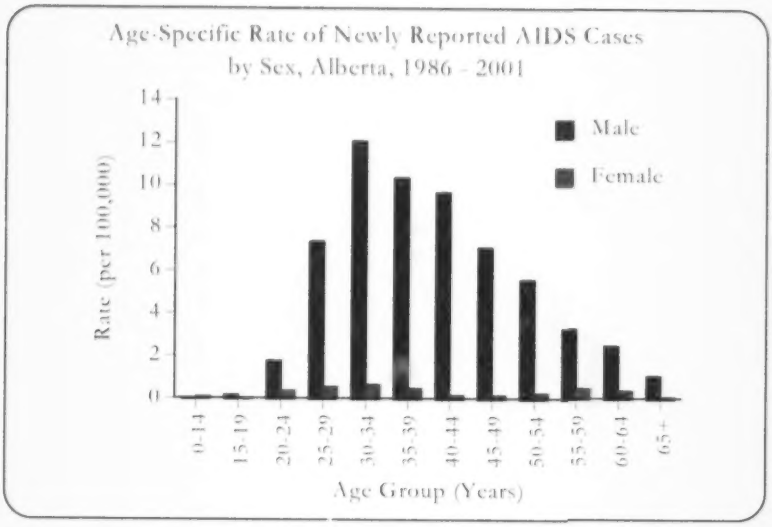
*HIV became reportable as of May 1998, so 1998 data may be incomplete

Female HIV cases were younger than male HIV cases on average.

- Age at reporting of HIV infection ranged from 10 months to 76 years between 1998 and 2001, with an average of 35.9 years.
- There were more male cases than female, in a ratio of 2.2 to 1 for 1998 to 2001 combined.
- The rate of newly reported cases of HIV infection in males was higher than females in all age groups, with the exception of age groups 15-19 years and 20-24 years.
- The rate of HIV infection peaked at ages 30-39 years for males and at ages 20-34 years for females.
- The majority (91%) of cases was in persons aged 20 to 49 years of age.

3.2.4 AIDS Age Effects

See Table 5

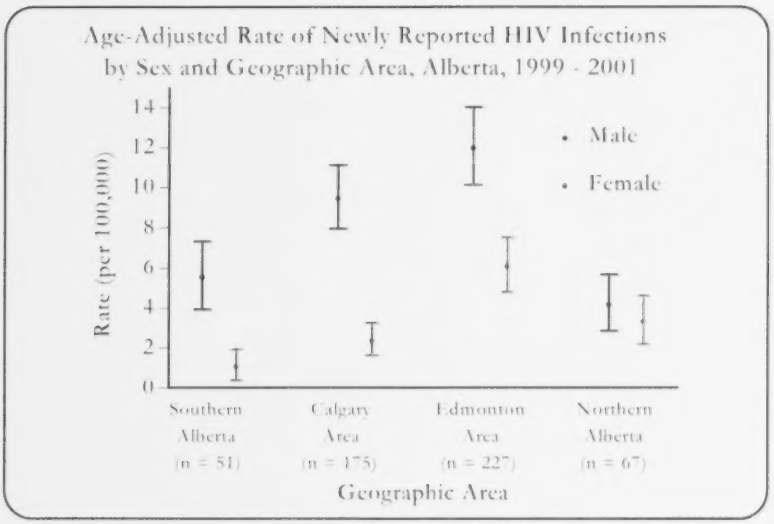


The typical newly reported AIDS case was male and about 40 years old.

- Age at reporting of AIDS ranged from six months to 78 years between 1986 and 2001, with an overall average of 38.7 in this time period.
- There was a significant increasing linear trend in average age over time for male newly reported cases of AIDS (there were too few female cases to analyse). The average age at reporting for males was 38.4 years in 1986 and 42.3 years in 2001.
- The rate of newly reported cases of AIDS in males was higher than in females in all age groups over 15 years.
- The rate of newly reported cases of AIDS peaked at age 30-34 years for 1986 to 2001 combined.
- Most cases (88.5%) were between 25 and 54 years of age.
- Age trends for AIDS may have varied from 1986 to 2001; however, there were too few cases to perform reliable statistical tests for such a trend.

3.2.5 HIV Geographic Effects

See Table 6



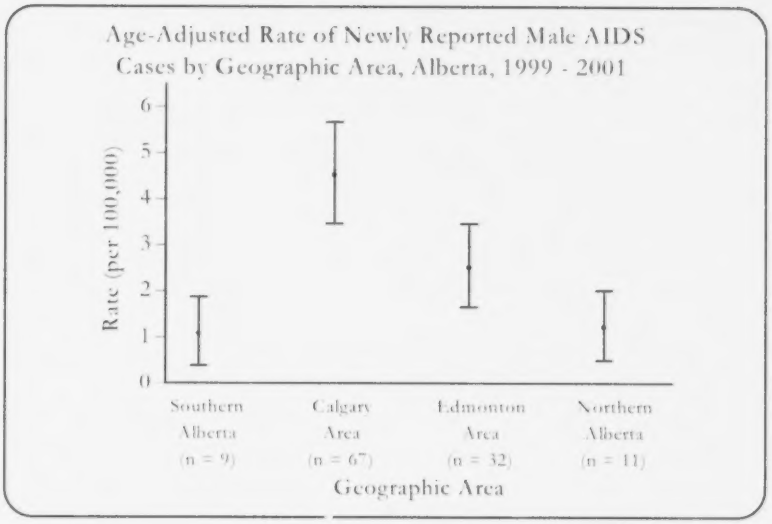
- For all geographic region analyses, rates (per 100,000 population) are for the years 1999 to 2001 combined.
- The rate of newly reported cases of HIV was highest (9.1 per 100,000) in the Edmonton area for both sexes. The Calgary area rate (5.9) was lower than the Edmonton area rate, but the rates for the Edmonton and Calgary areas were both higher than the rates for Southern (3.4) and Northern Alberta (3.8).

Rates of newly reported HIV infection were highest for males in Edmonton and Calgary, and for females in Edmonton.

- For males, the Calgary and Edmonton area rates did not differ from one another (9.5 per 100,00 for Calgary, 12.1 for Edmonton), and both were higher than Southern Alberta (5.6) and Northern Alberta (4.3), which did not differ statistically from one another.
- For females, only the Edmonton area had a higher risk of HIV infection (6.2 per 100,000) than the rest of the geographic areas (Southern Alberta 1.2, Calgary area 2.4, Northern Alberta 3.4). The Northern Alberta rate was higher than the Southern Alberta rate, but the Southern Alberta and Calgary rates did not differ from one another.

3.2.6 AIDS Geographic Effects

See Table 7

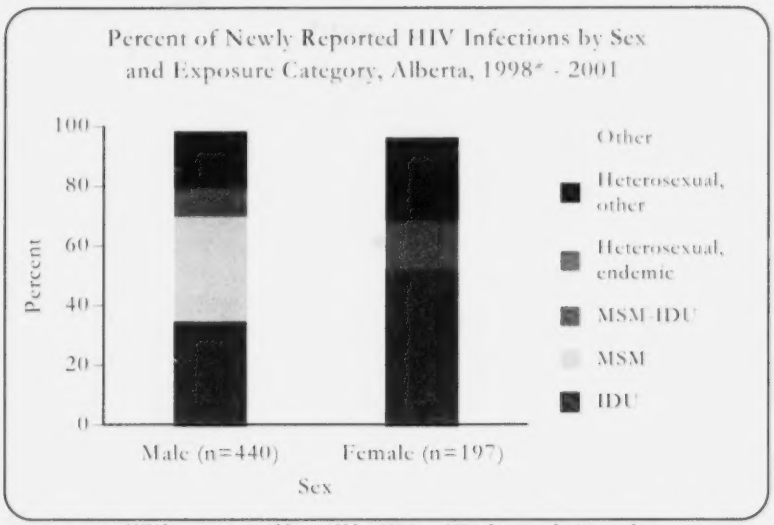


AIDS rates were highest in the Calgary area.

- For all geographic region analyses, rates (per 100,000) are for the years 1999 to 2001 combined.
- The rate of newly reported cases of AIDS was significantly higher in the Calgary area (2.6 per 100,000) than in Southern Alberta (0.6), the Edmonton area (1.3), and Northern Alberta (0.7). There were no differences in rates between these latter three areas.
- The pattern was the same for male AIDS cases. The rate was significantly higher in the Calgary area (4.6 per 100,000) than in Southern Alberta (1.1), the Edmonton area (2.6) Northern Alberta (1.3). Those three areas did not differ from one another.
- Analyses of the female cases were not performed due to small numbers of cases.

3.2.7 HIV Exposure Category

See Table 8



* HIV became reportable as of May 1998, so 1998 data may be incomplete

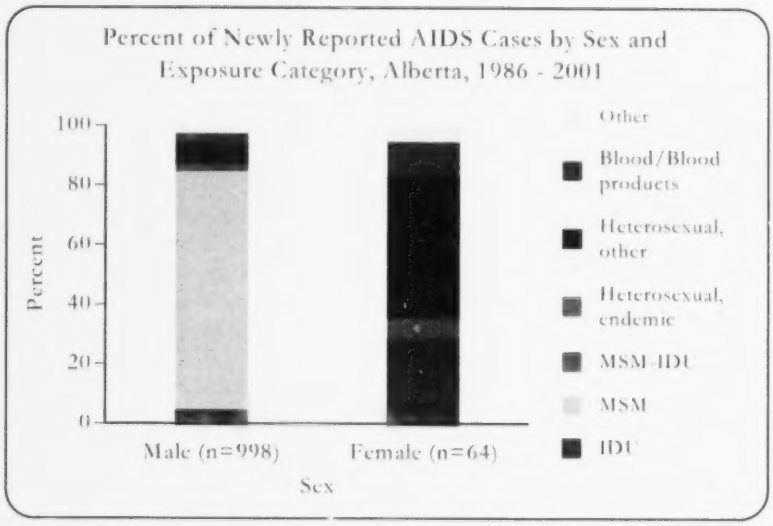
- See Glossary for description of exposure categories.
- Proportions of newly reported cases are based on combined 1998 to 2001 data.
- From 1998 to 2001, data on exposure category for HIV were complete. During this time period there were no HIV cases in which exposure to HIV was from a completely unknown source.

Heterosexual sex is an important source of HIV infection in Alberta.

- The injection drug use category contained the largest proportion of newly reported HIV cases for males (35.2%), followed by men who have sex with men (34.8%) and heterosexual contact (24.6%). The remaining exposure categories accounted for 5.5% of cases.
- Injection drug use was also the most common exposure category (52.8%) for females, followed by heterosexual contact (44.1%). The remaining exposure categories accounted for 3.0% of cases.

3.2.8 AIDS Exposure Category

See Table 9



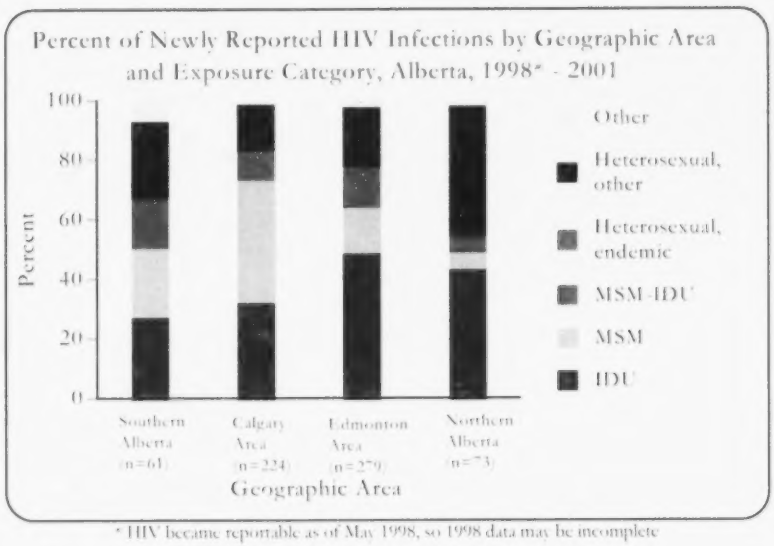
- See Glossary for description of exposure categories.
- Small numbers of newly reported AIDS cases per year necessitated that exposure category analyses be based on data for all 16 available years (1986 to 2001), rather than for recent years only.
- Data on exposure category were missing for 1.4% of cases. During this time period, the source of HIV infection was completely unknown for 1.5% of cases.

Most AIDS cases were men who have sex with men.

- For males, men who have sex with men accounted for 80.0% of the total newly reported AIDS cases, followed by heterosexual contact (8.3%) and injection drug use (5.4%). The remaining exposure categories accounted for 6.3% of cases.
- In females, heterosexual contact was the major exposure pathway for AIDS (54.7%), followed by injection drug use (29.7%), and blood/clotting factor (10.9%). The remaining 4.7% of cases were in the mother-to-child/pediatric category.

3.2.9 HIV Exposure Category by Geographic Area

See Table 10



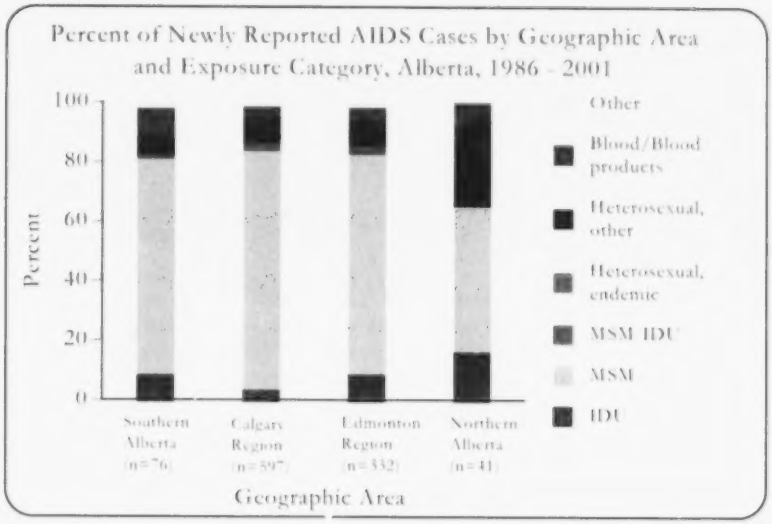
* HIV became reportable as of May 1998, so 1998 data may be incomplete

HIV exposure patterns varied across regions of the province.

- See Glossary for description of exposure categories.
- Proportions of newly reported cases are based on combined 1998 to 2001 data.
- Men who have sex with men accounted for 41.1% of cases in the Calgary area, 23.0% in Southern Alberta, 15.4% in the Edmonton area and 5.5% in Northern Alberta.
- Injection drug use was the assigned exposure category in 49.1% of infections in the Edmonton area, 43.8% in Northern Alberta, 32.6% in the Calgary area, and 27.9% in Southern Alberta.
- Heterosexual contact accounted for 47.9% of newly reported cases for Northern Alberta, 37.7% for Southern Alberta, 30.5% for the Edmonton area, and 23.2% for the Calgary area..

3.2.10 AIDS Exposure Category by Geographic Area

See Table 11



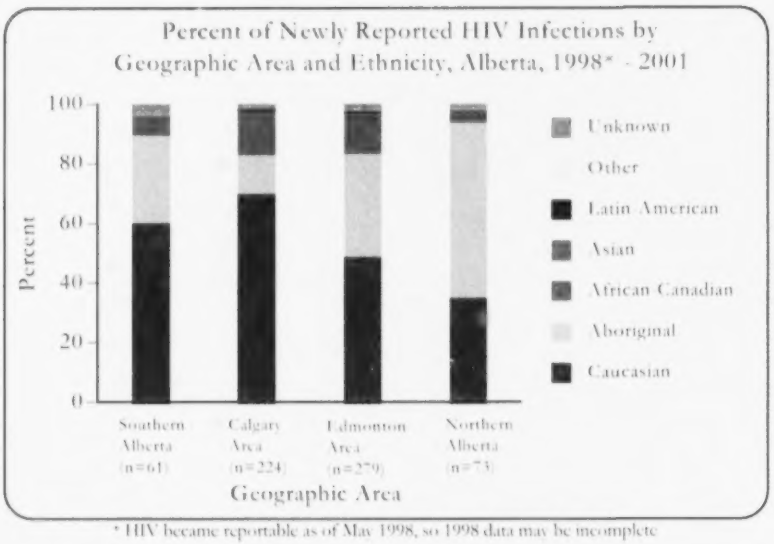
- See Glossary for description of exposure categories.
- Small numbers of newly reported AIDS cases per year necessitated that exposure category analyses be based on data for all 16 available years (1986 to 2001), rather than for recent years only.
- Proportions of newly reported cases are based on combined 1998 to 2001 data.

Men who have sex with men made up a smaller proportion of AIDS cases in Northern Alberta than in the other areas.

- Sex between men was the major route of exposure in newly reported AIDS cases in all geographic areas between 1986 and 2001. The proportion of cases in this exposure category was lower in Northern Alberta (46.5%) than in the other areas (79.0% in the Calgary area, 72.9% in the Edmonton area, and 71.4% in Southern Alberta).
- Heterosexual contact accounted for 27.9% of cases in Northern Alberta, 10.9% in the Calgary area, 10.7% in the Edmonton area, and 6.5% of cases in Southern Alberta.
- Injection drug use was the source of infection for 16.3% of AIDS cases in Northern Alberta, 9.1% in Southern Alberta, 9.2% in the Edmonton area and 4.1% in the Calgary area.

3.2.11 HIV Ethnicity by Geographic Area

See Table 12



* HIV became reportable as of May 1998, so 1998 data may be incomplete

- Ethnicity is taken from the Health Canada case report form for HIV/AIDS (see Appendix II). Categories include Caucasian, African-Canadian, Aboriginal (American Indian, Métis, or Inuit), Asian (Asian, South Asian, and Arab/West Asian), Latin-American, and Other (including mixed ethnicity).

- Proportions of newly reported cases are based on combined 1998 to 2001 data. Accurate population figures for the ethnic groups are not available. The data are thus *not* proportional to the various ethnic populations and must be interpreted accordingly.

- Ethnicity data were missing for 0.9% of newly reported HIV cases between 1998 and 2001. Ethnicity was unknown for 1.6% of cases during this time period.

The proportion of Caucasian HIV cases was twice as high in the Calgary area as in Northern Alberta.

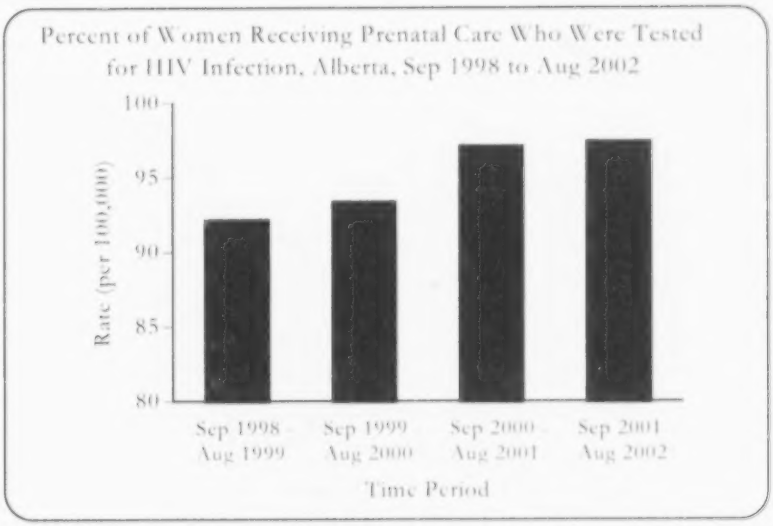
- Overall, Caucasians accounted for 56.4% of total newly reported HIV cases. This proportion was higher in the Calgary area (70.5%) and Southern Alberta (60.7%), but lower in Northern Alberta (35.6%) and the Edmonton area (49.5%).

- Aboriginal persons made up 29.5% of total newly reported HIV infections in Southern Alberta, 12.9% in the Calgary area, 34.4% in the Edmonton area, and 58.9% in Northern Alberta, with a provincial average of 29.2%.

- African-Canadians accounted for 9.4% of newly reported HIV infections provincially. The proportion of African-Canadian cases was higher in the Edmonton (11.8%) and Calgary (8.9%) areas than in Southern Alberta (6.6%) and Northern Alberta (4.1%).
- The remaining ethnicities comprised 5.0% of newly reported cases.
- There were too few AIDS cases to analyse ethnicity by geographic area for AIDS.

3.2.12 Prenatal Screening for HIV

See Table 13


Percent of Women Receiving Prenatal Care Who Were Tested for HIV Infection, Alberta, Sep 1998 to Aug 2002
Rate (per 100,000)
100
95
90
85
80
Sep 1998 - Aug 1999
Sep 1999 - Aug 2000
Sep 2000 - Aug 2001
Sep 2001 - Aug 2002
Time Period

- Prenatal HIV screening data are presented from the time of implementation of the province-wide screening program, rather than by calendar year.

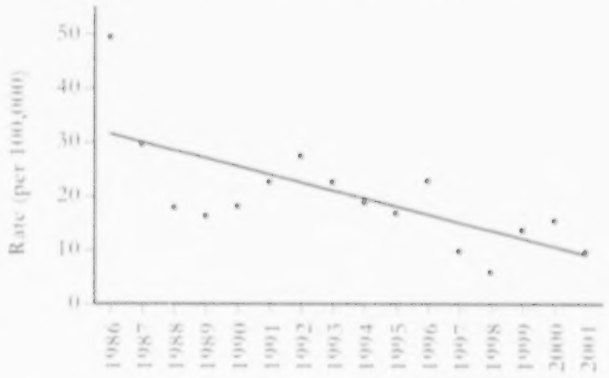
97.5% of women who accessed prenatal care were tested for HIV in 2001/02.

- Overall, the vast majority (94.9%) of women who received prenatal care was tested for HIV infection in Alberta between September 1998 and August 2002.
- The proportion of women who were tested increased significantly over time, from 92.2% in 1998-99 to 97.5% in 2001-02.
- Only a small proportion of women declined HIV testing through the "opt-out" screening program in effect in Alberta. This proportion decreased significantly over time, from 4.0% in 1998-99 to 1.9% in 2001-02. Data from previous analyses indicated that First Nations and older pregnant women were more likely to decline HIV testing.[17]
- A total of 72 pregnancies with confirmed HIV infection were reported over the four-year period, resulting in a rate of 0.48 per 1,000 live births. No variation over time was found.

3.2.13 Deaths among Reported AIDS Cases

See Table 14

Percent of Deaths in First Year After Diagnosis for Newly Reported AIDS Cases, Alberta, 1986 - 2001



AIDS deaths have declined dramatically since the mid-1990's.

- Deaths reported here include only those that were *caused* by HIV or AIDS. HIV and AIDS likely *contributed* to more deaths than are reported here.
- 708 deaths from AIDS were reported to the CDRS between 1986 and 2001. The annual number of reported AIDS deaths peaked in 1994 and declined significantly thereafter, with an 88% drop in reported AIDS deaths between 1994 and 2001.
- From 1986 to 2001, 20.0% of newly reported AIDS cases died in the first year after diagnosis of AIDS. There was a significant downward trend in the proportion of newly reported cases that died in the first year after diagnosis, from 50.0% in 1986 to 10.3% in 2001.
- Mean age at death steadily increased from 1986 through 2001, after controlling for the effect of age at reporting, year of diagnosis, sex, exposure category, and ethnicity, from 32.2 years in 1986 to 44.7 years in 2001.
- These trends reflect increased survival, which is likely partly attributable to advances in the treatment of HIV/AIDS since the mid-1990s.

HCV

1 *Background*

Hepatitis C is caused by the hepatitis C virus (HCV), which was first identified in 1989[18,19]. Before then, hepatitis C was included in the category 'non-A, non-B hepatitis'. The incubation period for HCV infection averages 6 to 7 weeks, with a range from 2 weeks to 6 months.[8] The most common symptoms for acute hepatitis C are fatigue and jaundice. Acute hepatitis C tends to be mild and have insidious onset. About 60-70% of newly infected persons, especially children, are asymptomatic.[8,20] About 80% of persons with hepatitis C progress to chronic and persistent infection.[21] Up to 20% of chronically infected persons may develop liver cirrhosis or liver cancer after 20-30 years of infection.[20]

HCV is most commonly spread through injection drug use.

HCV is primarily transmitted through exposure to infected blood, and it is much more likely (10-15 times) than HIV to be transmitted by infected blood.[22] Injection drug users, especially those sharing needles with others, are at the greatest risk for HCV infection. It is estimated that 60-90% of injection drug users are infected with HCV.[8] Sexual contact plays a relatively smaller role in the transmission of HCV than HIV.[18] Approximately 5-10% of infants born to infected mothers may be infected (mother-to-child transmission).[8,23] In Canada, transmission of HCV through blood transfusion has been uncommon since the introduction of universal testing of blood donations for HCV in 1990.

There is no vaccine for the prevention of HCV infection. Treatment is costly and complex. The outcome of treatment for HCV varies depending on the strain or genotype of the virus. Treatment combinations containing pegylated interferon and ribavirin result in a response rate of 42-46% with genotype 1, the most common strain of HCV found in North America, and 76-82% with genotypes 2 and 3.[24,25,26]

HCV is diagnosed by clinical assessment and serological testing. A case definition for HCV, published by Health Canada in 2000, is found in Appendix III. A new case definition for HCV is being developed by Alberta Health and Wellness, and will take effect in the near future.

HCV has been reportable in Alberta since 1996. Note that many HCV cases were diagnosed prior to 1996 but not reported to the CDRS; these cases do not appear in this report. Much of the burden of hepatitis C in Alberta may be represented by these earlier diagnosed chronic cases.

2 *International and National Data*

Worldwide, it is estimated that 170 million persons were infected with HCV as of June 1999. This represents about 3% of the world's population, about four times the number of people infected with HIV. The prevalence rate is highest in Africa (5.3%), compared to 1.7% in the Americas, and 1.0% in Europe. Incidence of HCV is high, with an estimated 3 to 4 million persons worldwide becoming newly infected each year.[27]

Prevalence of HCV infection in Canada is estimated to be 0.8% of the population. Prevalence is higher for males (0.96%) than females (0.53%).[28]

There were 19,397 newly reported cases of HCV in Canada in 1999, resulting in a rate of 63.6 reported cases (per 100,000 population). There were more male cases than female cases, and the highest rate of reported cases was in the 30-39 year age group.[29] Injection drug use is responsible for at least 60% of new HCV infections in Canada.[30]

The burden of disease for HCV in Canada is considerable.

The burden of disease associated with hepatitis C in the near future of Canada is expected to be substantial. Using a simulation based on the 240,000 people estimated to be living with hepatitis C in Canada, the number of hepatitis C-related cirrhosis cases is expected to increase by 92% from 1998 to 2008. Liver failures attributed to hepatitis C will increase by 126%, while hepatocellular carcinomas related to hepatitis C will increase by 102%. Need for liver transplants will increase by 246% and liver-related deaths associated with hepatitis C are estimated to increase by 126%.[31]

Injection drug use is the major mode of transmission of HCV. As rates of injection drug use increase among young people in many developed countries, the future burden of disease from hepatitis C is expected to increase concomitantly.

It is estimated that 1,161 deaths were associated with hepatitis C in Canada in 1997; this figure corresponds to 0.5% of all deaths in Canada in that year. The mortality rate for hepatitis C for males is more than twice that for females. Trends from 1979 to 1997 indicate that hepatitis C mortality per 100,000 population increased considerably.[31]

3 *Alberta Data*

3.1 Highlights

HCV data are for 1998 to 2001.

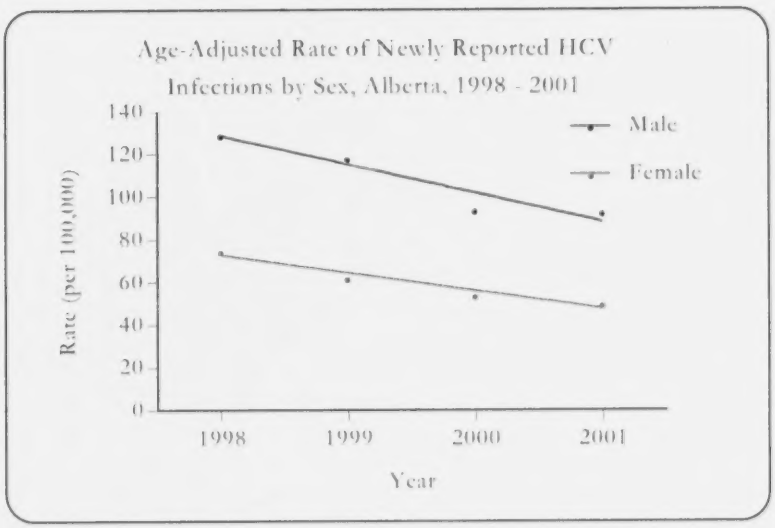
Analyses are based on cases reported for the first time only (newly reported cases).

- The age-adjusted rate of newly reported cases of HCV infection was 84.2 (per 100,000 population) for 1998 to 2001.
- Males comprised about two-thirds of cases.
- Rates peaked between the ages of 25 and 54.
- Infection rates were highest in the Edmonton area. Southern Alberta also had an elevated rate for males.
- First Nations individuals are over-represented in newly reported cases of HCV.

3.2 Details

3.2.1 Time Trends

See Table 15

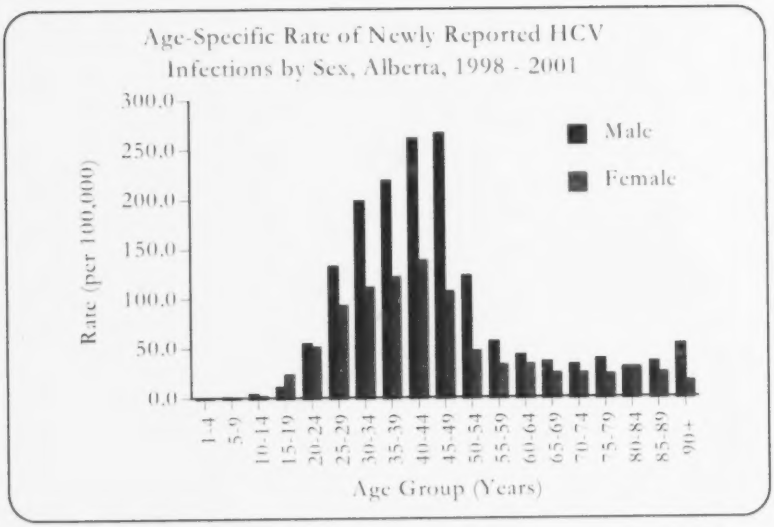


- In 2001, 2,191 new cases of HCV were reported in Alberta.
- Of these cases, 64.9% were male.

The rate of newly reported cases of HCV is declining.

- A declining trend in the rate of newly reported cases of HCV infection is evident. In 1998, the combined age-adjusted rate for both sexes combined was 102.0 (per 100,000 population), compared with 71.2 in 2001.
- The age-adjusted rate was higher for males than for females in all years between 1998 and 2001.
    - For males, the 2001 rate was 92.8 (per 100,000). The female rate was 49.9 in 2001.
    - The declining trend over time applies to both male and female rates.
- Note that while newly reported cases of HCV are declining over the time period examined, much of the current burden of disease for hepatitis C in Alberta may come from chronic cases of HCV diagnosed prior to 1998 that are not reported here.

3.2.2 Age Effects



See Table 16

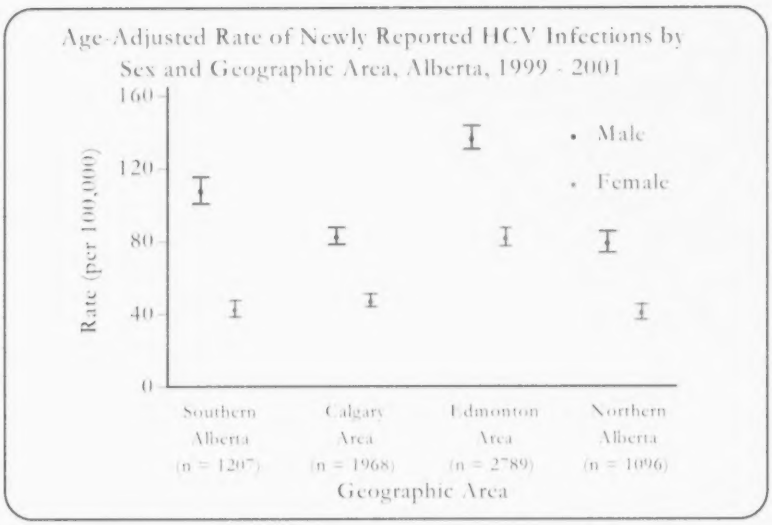
- Some, but not all, regions reported all infants positive for HCV antibodies as HCV cases, although antibodies found in infant blood may be passively transmitted from an infected mother and may or may not be an indication of HCV infection in the infant. Due to this inconsistency in reporting of HCV infections in infants, we have excluded from our analyses cases of HCV reported prior to 18 months of age.
- Infants who are positive for HCV antibodies are followed up after 18 months to determine whether they are HCV positive.
- The average age at reporting of new cases of HCV was 40.8 years for 1998 to 2001. In 2001, the average age was 42.7 years.
- Rates were higher for males than for females (110.2 and 61.9 per 100,000, respectively), with the exception of 15 to 19 year olds (the rates were 11.4 and 24.1 in this age group for males and females, respectively).

Most cases of HCV occurred in people aged 25 to 49.

- Rates peaked between the ages of 25 and 54 for males, and between the ages of 25 and 49 for females.
- From 1998 to 2001, 85.0% of newly reported cases of HCV infection were individuals aged 25 to 54 years.

3.2.3 Geographic Effects

See Table 17



- For all geographic region analyses, rates (per 100,000) are for the years 1999 to 2001 combined.

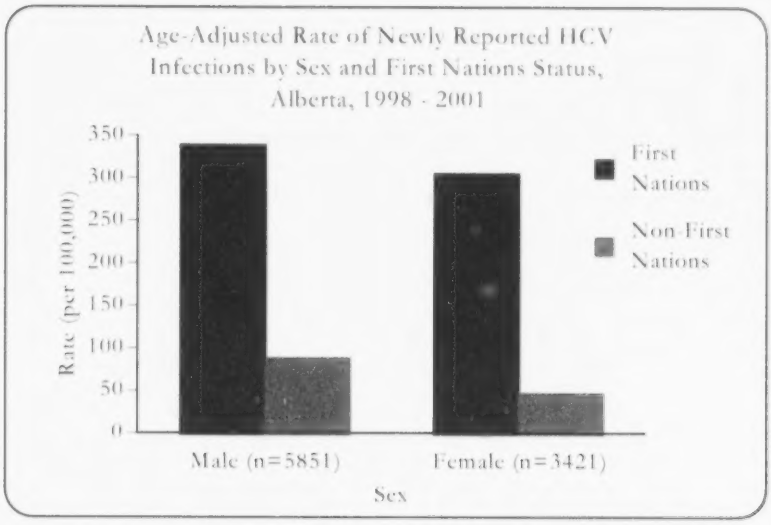
- For males, the age-adjusted rate of newly reported HCV infections in the Edmonton area (137.3 per 100,000) was significantly higher than the Southern Alberta rate (108.3), and both of these rates were higher than those in the Calgary area (83.0) and Northern Alberta (79.8).

HCV rates were highest in the Edmonton area.

- For females, the age-adjusted rate of HCV infection was also higher in the Edmonton area (82.3 per 100,000) than in the other three regions. Rates in Southern Alberta (43.2), the Calgary area (47.6), and Northern Alberta (41.3) did not differ from one another.

3.2.4 First Nations Status

See Table 18



- Ethnicity data for HCV and acute HBV were incomplete. For this reason, a linkage between HCV and acute HBV data sets and the Alberta Health Care Insurance Plan Registry was performed to obtain information on First Nations status.

- Persons having First Nations status are registered under the *Indian Act*[1] or are recognized as Inuit or Innu (see Glossary). Note that this category excludes Métis persons, unlike the Aboriginal ethnicity category used for the HIV/AIDS analyses.

- First Nations status cases accounted for 13.1% of newly reported cases of HCV, but only 3.5% of the population was First Nations status during the period 1998 to 2001.

- Overall, the age-adjusted rate for 1998 to 2001 combined (per 100,000 population) was 325.3 (per 100,000) for First Nations status persons, and 69.3 (per 100,000) for non-First Nations persons.

HCV infection rates were high but decreasing for First Nations.

- The age-adjusted rate declined significantly for the First Nations population (from 392.4 in 1998 to 227.0 in 2001, per 100,000), but the decrease for the non-First Nations population was not significant (82.9 in 1998 to 59.6 in 2001, per 100,000).

- Age-adjusted rates of newly reported HCV infection for First Nations males and females were similar (238.2 for males and 202.9 for females in 2001), while for non-status persons, the rate was higher for males than for females (76.5 for males and 39.4 for females in 2001).

3.2.5 Deaths due to Hepatitis C

In Alberta from 1998 to 2001, there were 57 deaths due to hepatitis C reported to Vital Statistics, including 13 in 2001. Note that these deaths include only those for which hepatitis C was reported as the underlying cause of death.

Many deaths caused by chronic liver diseases may be attributable to hepatitis C. In Alberta, from 1998 to 2001, there were 1004 deaths caused by chronic liver disease (see Appendix IV for a description of the coding used to attribute deaths to hepatitis C and chronic liver disease). The most common types of chronic liver diseases during this time period were cirrhosis (48%), liver cancer (27%), and alcoholic liver damage (11%).

Estimates from the Centers for Disease Control in the United States suggest that approximately 40% of deaths from chronic liver diseases can be attributed to hepatitis C. [31,32] Based on this estimation, 402 deaths would be attributed to hepatitis C. When the 57 deaths attributed directly to hepatitis C are added to this figure, there were 459 estimated deaths due to hepatitis C in Alberta from 1998 to 2001. Males accounted for 61% of these deaths, and 58% were between 15 and 64 years old, with an average age of 59.1 years.

Acute HBV

1 *Background*

Hepatitis B is caused by hepatitis B virus (HBV). The incubation period for acute infection is about 90 days.[8] Acute hepatitis B has a wide spectrum of clinical manifestations, including anorexia, vomiting, malaise, jaundice and abdominal pain. However, about 90% of infections among children and 50% to 70% among adults are asymptomatic.[33] More than 90% of immune-competent persons who are infected with HBV, after an acute self-limited hepatitis, develop a long-lasting immunity to re-infection. On the other hand, 5-10% of people who are exposed to HBV become chronic carriers.[34] Progression to chronic (carrier) infection is inversely related to age. That is, persons infected at a young age are at increased risk of becoming chronically infected.[35,51] Chronic infections can have long-term sequelae, such as cirrhosis and hepatocellular carcinoma.

In Canada, as in other developed countries, the most common transmission mode for HBV is through unprotected sexual contact, followed by injection drug use and occupational exposure to infected blood.[36,37] Mother-to-child transmission is also possible. About 80 to 90% of untreated infants who are born to HBV-positive mothers will be infected with HBV.[8]

Vaccination is available for prevention of HBV.

HBV infection is preventable by vaccination. The vaccine is safe and effective, and there is evidence for long-term protection.[8] To reduce and eventually eliminate transmission of HBV, universal immunization is necessary. In Alberta, a grade 5 school based immunization program was put in place in 1995. From 1999 to 2001, a grade 12 "catch-up" program was also in effect, providing immunization to a cohort of individuals not immunized by the grade 5 program.

All pregnant women who access prenatal care have been offered HBV screening (for both acute and chronic hepatitis B) since 1985, and this program has proven very successful.[38] Infants who are born to HBV positive mothers in Alberta are given prophylactic treatment including immuno-globulin and vaccine to prevent mother-to-child transmission of HBV. HBV vaccines are also administered to high-risk health care workers, immigrants from endemic countries, and individuals who have close contact with infected persons.

Treatment for HBV is complex and is usually with interferon-alpha and/or lamivudine. Response to treatment varies depending on stage of liver disease and duration of treatment.[39]

Acute HBV is diagnosed by clinical assessment and serological testing. A case definition for acute HBV, published by Health Canada in 2000, is found in Appendix III. A new case definition for acute HBV is being developed by Alberta Health and Wellness, and will take effect in the near future.

Acute HBV has been reportable in Alberta since 1977.

2 *International and National Data*

The acute HBV rate for Canada was 4.2 per 100,000 in 1999.

Worldwide prevalence of hepatitis B is high, with 350 million chronic infections worldwide. More than 2 billion people have been infected with HBV in total. Most people in the developing world contract the virus in childhood and 8% to 10% of the population in these areas is chronically infected. In Western Europe and North America, less than 1% of the population is chronically infected.[40]

There were 1,278 cases of acute HBV reported in Canada in 1999, which represents a rate of 4.2 reported cases per 100,000 population. The number of reported cases of acute HBV declined from 1996 on, though the rate of 4.2 reported in 1999 was an increase over the 1998 rate of 3.2. The reported rate per 100,000 population was 5.3 for males and 3.1 for females. The rates were highest in the 25-29 year age group and 30-39 year age group.[29]

Estimates of the prevalence of HBV carriers in Canada range from 0.5% to 2.0% of the population.[41,35] In general, Canada has a low overall prevalence rate for HBV, though rates in Aboriginal and Asian populations, as well as in "street-connected" individuals are similar to those in high-prevalence regions in the world.[41]

It is estimated that 440 deaths attributed to hepatitis B occurred in 1997; this represents 0.2% of all deaths in Canada in that year. Mortality rates for hepatitis B increased up to 1995, and showed a decline between 1995 and 1997. Hepatitis B mortality rates for males are more than twice that for females.[31]

3 *Alberta Data*

3.1 Highlights

Acute HBV data are for 1986 to 2001.

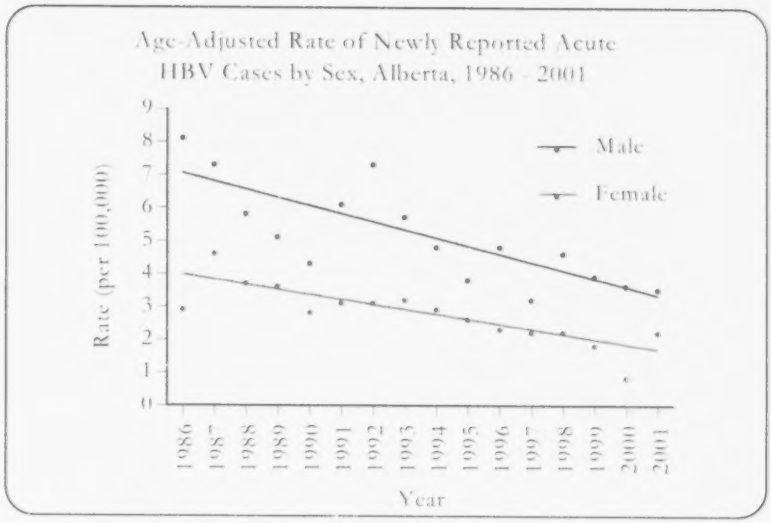
Analyses are based on cases reported for the first time only (newly reported cases).

- The age-adjusted rate of newly reported acute HBV infections was 4.0 (per 100,000 population) for 1986 to 2001 combined. The rate declined over time; for 2001, the rate was 3.0.
- Approximately two-thirds of newly reported cases of acute HBV were male.
- Rates of newly reported acute HBV infections peaked between the ages of 20 and 34 years for males, and between 15 and 29 years for females.
- There were no significant geographic variations in acute HBV rates within the province from 1999 to 2001.
- First Nations individuals were over-represented in acute HBV cases.
- Virtually all pregnant women who accessed prenatal care in Alberta were tested for acute and chronic HBV by 2002.

3.2 Details

3.2.1 Time Trends

See Table 19

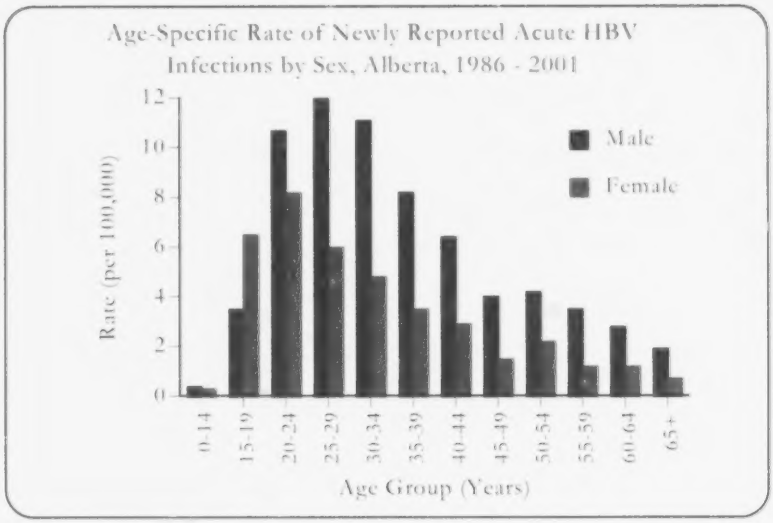


HBV infections are declining in Alberta.

- There were 89 newly reported cases of acute HBV in Alberta in 2001, for an age-adjusted rate of 3.0 (per 100, 000 population).
- Males accounted for 61.2% of newly reported cases in 2001.
- The age-adjusted rate of newly reported acute HBV infections declined over time, from 5.6 (per 100,000 population) in 1986 to 3.0 in 2001.
- The rate was consistently higher for males than for females. The average age-adjusted rate for males in 2001 was 3.6 (per 100,000 population), while the rate for females was 2.3.

3.2.2 Age Effects

See Table 20



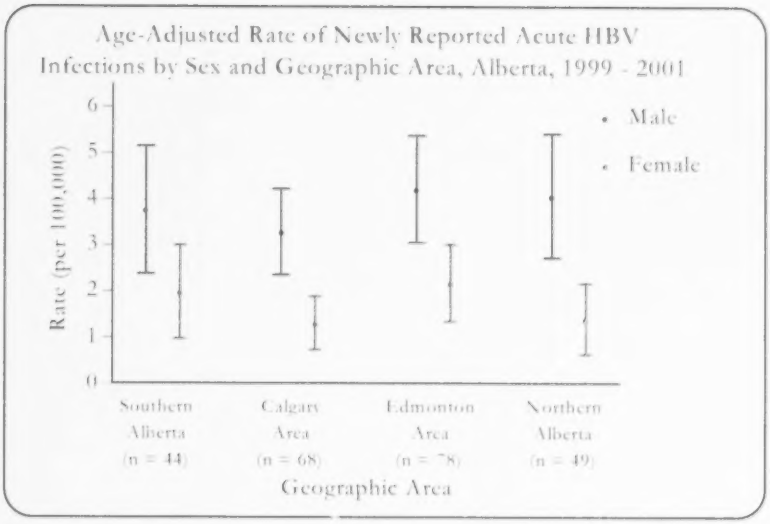
- The average age at reporting for newly reported cases of acute HBV between 1986 and 2001 was 33.1 years. Average age at reporting increased during this time period, from 31.8 years in 1986 to 39.4 years in 2001.
- For both sexes, the highest rates of newly reported acute HBV infections occurred in relatively young age groups.
  - For males, the highest rates occurred between the ages of 20 and 34 years for 1986 to 2001 combined.
  - For females, rates peaked between 15 and 29 years for the same time period.
- For 15-19 year olds between 1986 and 2001, the rate of newly reported cases of acute HBV was greater for females than for males (6.5 vs. 3.5 per 100,000 population). For all other age groups, the rate was greater for males than for females.

The HBV rate was higher for males in all age groups other than 15-19 years.

- Age trends for HBV may have varied from 1986 to 2001; however, there were too few cases to perform reliable statistical tests for such a trend.

3.2.3 Geographic Effects

See Table 21

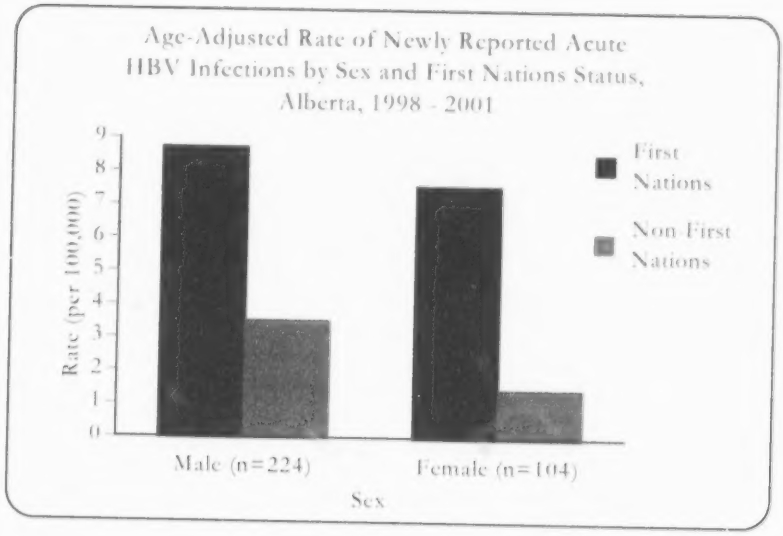


HBV rates did not vary across the province.

- There were no significant geographic differences in rates of newly reported acute HBV infections for 1999 to 2001 combined.
- The rates (per 100,000 population) for the four areas did not differ from one another, for both males and females.

3.2.4 First Nations Status

See Table 22



- Persons having First Nations status are registered under the *Indian Act*[1] or are recognized as Inuit or Innu (see Glossary). Note that this category excludes Métis persons, unlike the Aboriginal ethnicity category used for the HIV/AIDS analyses.

- First Nations cases accounted for 10.0% of newly reported cases of acute HBV, but only 3.5% of the population was First Nations in the period 1998 to 2001.

HBV infection rates were high amongst the First Nations population.

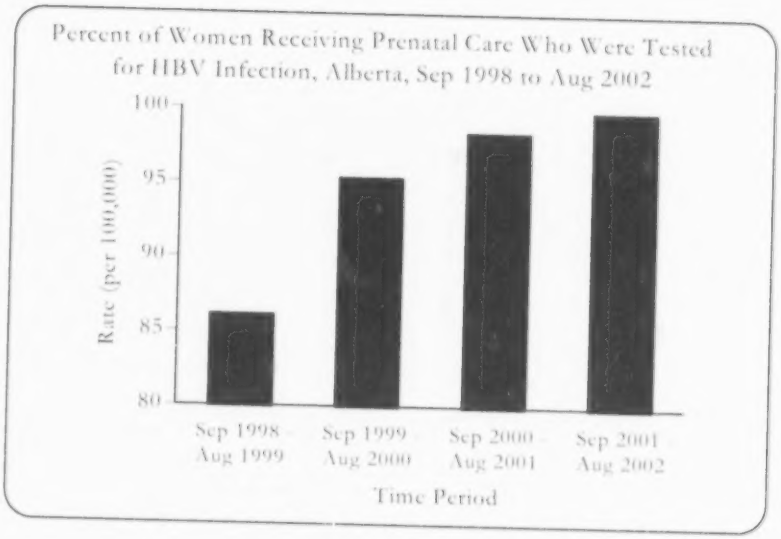
- Overall, the age-adjusted rate of newly reported acute HBV infections for 1998 to 2001 combined (per 100,000 population) was 8.2 (per 100,000) for First Nations persons, and 2.5 (per 100,000) for non-First Nations persons.

- The age-adjusted rate of newly reported cases of acute HBV infection did not vary significantly with time between 1998 and 2001.

- Age-adjusted rates of newly reported acute HBV infection for First Nations males and females were similar (8.8 for males and 7.6 for females for 1998 to 2001). For non-First Nations persons, the rate was higher for males than for females (3.5 for males and 1.5 for females for 1998 to 2001).

3.2.5 Prenatal Screening for HBV

See Table 23


Percent of Women Receiving Prenatal Care Who Were Tested for HBV Infection, Alberta, Sep 1998 to Aug 2002
100
95
90
85
80
Rate (per 100,000)
Sep 1998 - Aug 1999
Sep 1999 - Aug 2000
Sep 2000 - Aug 2001
Sep 2001 - Aug 2002
Time Period

Virtually all women presenting for prenatal care in 2001/02 were tested for HBV.

- HBV prenatal screening data became available in September 1998, and are reported from September 1998 to August 2002. HBV prenatal screening includes both acute and chronic HBV.
- Overall, the large majority (94.6%) of women who received prenatal care in Alberta was tested for HBV infection from September 1998 to August 2002.
  - The proportion of women who were tested increased, from 86.2% in 1998-99 to 99.9% in 2001-02.
- A total of 797 pregnancies with confirmed HBV infections were reported between September 1998 and August 2002, resulting in a rate of 5.3 per 1,000 live births. No variation over time was found.

3.2.6 Deaths Due to Hepatitis B

69 deaths with hepatitis B listed as the underlying cause were reported to Vital Statistics from 1986 to 2001, including 5 in 2001. Note that these deaths include only those for which hepatitis B was reported as the cause of death.

Some deaths due to chronic liver diseases may be attributable to hepatitis B. Analysis of the Vital Statistics death data shows that there were 3329 deaths caused by chronic liver disease in Alberta from 1986 to 2001 (see Appendix IV for a description of the coding used to attribute deaths to hepatitis B and chronic liver disease). The most common types of liver disease during this time period were cirrhosis (57%), liver cancer (19%), and alcoholic liver damage (11%).

Estimates from the Centers for Disease Control in the United States suggest that approximately 14% of deaths from chronic liver disease can be attributed to hepatitis B[31,32]. Based on this estimation, 466 deaths would be attributed to hepatitis B. When the 69 deaths attributed directly to hepatitis B are added to this figure, there were 535 estimated deaths due to hepatitis B in Alberta from 1986 to 2001. Males accounted for 68% of these deaths, and 70% were between 15 and 64 years old, with an average age of 53.8 years.

Co-infections

1 *Background*

Co-infection can modify disease development and affect treatment.

HIV/AIDS, hepatitis C, and hepatitis B are syndromes or diseases caused by pathogens with common modes of transmission. Among high-risk groups such as injection drug users, men who have sex with men, and persons who have multiple sex partners and engage in unprotected sexual activities, co-infections of HIV, HCV and HBV are likely. Co-infection modifies the course of disease development and may lead to increased comorbidity and mortality. Co-infection may also reduce the efficacy of treatments and increase the possibility of adverse effects from treatments. For instance, hepatitis B patients co-infected with HIV have a higher chance of chronicity, more viral replication, lower rates of HBV antigen clearance and higher risk for hepatocellular carcinoma.[42] Acute HBV and HCV co-infection increases the risk for becoming a chronic carrier of HBV, developing liver fibrosis, and developing cancer.[43] HIV and HCV co-infected patients have increased risk of liver complications and transmission of HCV.[43,44,45] Co-infection with HIV and HBV or HCV is associated with severe hepatotoxicity during the treatment of HIV infection.[46]

The use of highly active anti-retroviral therapies (HAART) has dramatically improved survival in persons with HIV infection. There has been a shift from morbidity related to opportunistic infection to morbidity related to complications of chronic diseases such as hepatitis B and hepatitis C, and consequences of injection drug use. As patients continue to live longer with HIV infection, HCV and HBV co-infection will become an increasingly important issue.

2 *International and National Data*

Injection drug users account for most HCV-HIV co-infections in Canada.

In the United States, up to 400,000 people may be co-infected with HIV and HCV, and liver disease is the most common cause of non-AIDS deaths among HIV patients.[45]

It is estimated that 11,914 people were co-infected with HCV and HIV in Canada as of December 1999. Injection drug users accounted for 71% of estimated HCV-HIV co-infected persons, and men who have sex with men and also inject drugs accounted for a further 15% of the estimated HCV-HIV co-infections.[5]

3 *Alberta Data*

3.1 Highlights

Co-infection data are for 1998 to 2001.

Analyses are based on cases reported for the first time only (newly reported cases).

- Of HIV/AIDS cases newly reported from 1998 to 2001, 19.7% were co-infected with HCV.
  - Injection drug users constituted the majority of this group.
  - Almost half of the injection drug users with HIV/AIDS were co-infected with HCV.
- Of HCV cases newly reported from 1998 to 2001, 1.1% were co-infected with HIV/AIDS.
- Of acute HBV cases newly reported from 1998 to 2001, 21.9% were co-infected with HCV.
- Co-infections were considerably more likely in Aboriginal/First Nations populations than in non-Aboriginal/First Nations persons.

3.2 Details

3.2.1 Co-infections by Year

See Table 24

About 20% of HIV/AIDS cases and 22% of acute HBV cases were co-infected with HCV.

- There were 140 newly reported cases of HIV/AIDS from 1998 to 2001 that were co-infected with HCV at the time of reporting. This represents 19.7% of newly reported cases of HIV/AIDS during that time period.
    - A further 10 cases (or 1.4% of all newly reported cases) with HIV/AIDS became co-infected with HCV in a year following that in which they were reported as having HIV/AIDS.
- The 105 cases of newly reported HCV infection reported between 1998 and 2001 that were co-infected with HIV/AIDS represent just 1.1% of the HCV population.
    - A further 45 HCV cases became co-infected with HIV/AIDS in a year following that in which they were reported as having HCV, representing an additional 0.5% of HCV cases.
- From 1998 to 2001, there were 75 newly reported cases of acute HBV co-infected with HCV at the time of reporting. These cases represented 21.9% of the acute HBV-infected cases.
    - Eight more cases of HCV were reported among these acute HBV cases in a year following that in which they were reported as having acute HBV (an additional 2.3% of cases).
- HIV cases co-infected with HBV, HCV cases co-infected with HBV, and acute HBV cases co-infected with HIV/AIDS are not reported due to insufficient numbers of cases for analysis.

3.2.2 HIV/AIDS with HCV, by Exposure Category

See Table 25

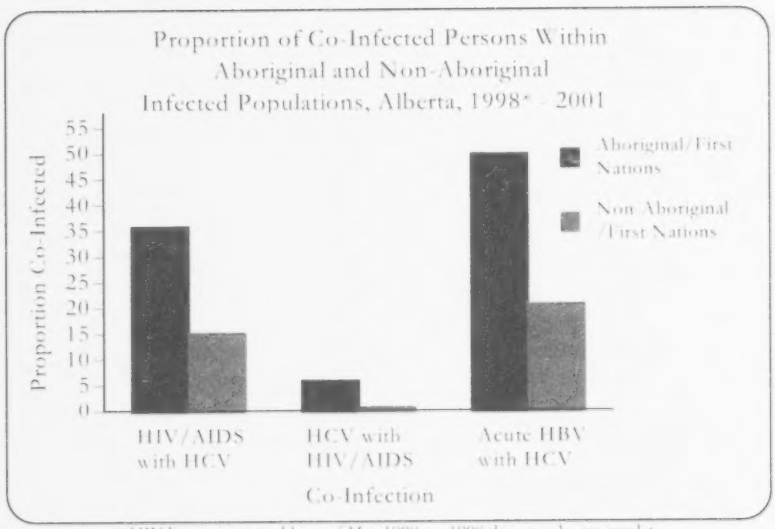
Most HIV/AIDS cases co-infected with HCV were injection drug users.

- Among HIV/AIDS cases, 86.0% of those co-infected with HCV contracted HIV through injection drug use and 12.7% through heterosexual contact.
- HIV/AIDS cases not co-infected with HCV were split amongst the categories of men who have sex with men (32.3%), injection drug users (30.3%), and heterosexual contact (34.9%).
- Of HIV/AIDS cases infected through injection drug use, 43.1% were co-infected with HCV, compared with 8.8% of those infected with HIV/AIDS through heterosexual contact.

3.2.3 Co-Infections by Aboriginal/ First Nations Status

See Table 26

Co-infection proportions are high in the Aboriginal/First Nations population.



* HIV became reportable as of May 1998, so 1998 data may be incomplete

- 47.3% of HIV/AIDS cases co-infected with HCV were Aboriginals, compared with 22.6% of cases not co-infected.
- Among Aboriginals with HIV/AIDS, 35.9% were co-infected with HCV, compared with 15.4% among non-Aboriginals.
- 47.3% of HCV cases co-infected with HIV/AIDS had First Nations status, compared with 11.6% of HCV cases not co-infected with HIV/AIDS.
- Among First Nations individuals with HCV, 5.9% were co-infected with HIV/AIDS, compared with 0.9% among non-First Nations individuals.
- 21.8% of acute HBV cases co-infected with HCV were of First Nations status, compared with 6.9% of acute HBV cases not co-infected with HCV.
- Among First Nations individuals with HBV, 50.0% were co-infected with HCV, compared with 20.9% among non-First Nations persons.

Summary

HIV/AIDS

- More new HIV cases are reported in Alberta than AIDS cases each year. In 2001, there were 169 newly reported HIV cases and 42 newly reported cases of AIDS.

- HIV/AIDS remains largely a disease affecting male people, though in 2001 a larger proportion of females were among newly reported HIV cases (27.2%) than AIDS cases (11.9%).

- Average age for newly reported HIV cases is necessarily lower than that for newly reported AIDS cases, however the average age for AIDS cases has increased over time (to 42.3 years in 2001).

- HIV/AIDS rates are generally elevated in large urban areas (Edmonton and Calgary) relative to rural areas.

- In males, newly reported HIV cases occur most often among injection drug users and men who have sex with men. Females are most often infected with HIV through injection drug use and heterosexual contact. Men who have sex with men constitute the largest exposure category for male AIDS cases, while heterosexual contact and injection drug use predominate for female AIDS cases.

- The Aboriginal population accounts for a high proportion of new HIV infections.

- The proportion of women receiving prenatal care who were tested for HIV increased, from 92.2% in 1998-99 to 97.5% in 2001-02.

- AIDS deaths have been remarkably reduced since the advent of HAART therapy. There were 11 deaths of AIDS cases in 2001.

HCV

- There were 2,191 newly reported HCV infections in Alberta in 2001, for an age-adjusted rate of 71.2 (per 100,000 population). The rate decreased from 102.0 in 1998.

- Newly reported cases of HCV infection occurred in a 1.8:1 male to female ratio. However, the rate of newly reported cases was higher for females than for males in the 15-19 year age group.

- The average age for a newly reported case of HCV in 2001 was 42.7 years.

- For males, the highest rates of newly reported HCV infections were in the Edmonton area and Southern Alberta from 1999 to 2001. For females, the Edmonton area had the highest rate of new infections in that time period.

- During the period 1998 to 2001, First Nations status individuals accounted for 13.1% of newly reported cases of HCV, but only 3.5% of the Alberta population.

- There were an estimated 459 deaths due to hepatitis C from 1998 to 2001.

Acute HBV

- There were 89 newly reported cases of acute HBV in Alberta in 2001, for an age-adjusted rate of 3.0 (per 100,000 population). This rate decreased over time, from 5.6 in 1986.

- Newly reported cases occurred in a male to female ratio of approximately 2:1 from 1986 to 2001.

- Average age at reporting increased, from 31.8 years in 1986 to 39.4 years in 2001. As with HCV, the rate of newly reported acute HBV cases was higher for females than males in the 15-19 year age group.

- HBV rates did not vary significantly across the regions of the province for 1999 to 2001.

- First Nations cases accounted for 10.0% of newly reported cases of acute HBV, but only 3.5% of the population was First Nations in the period 1998 to 2001.

- The proportion of women receiving prenatal care who were tested for HBV increased, from 86.2% in 1998-99 to 99.9% in 2001-02.

- There were 535 estimated deaths due to hepatitis B in Alberta from 1986 to 2001.

Co-Infections

- Co-infections are generally high among injection drug users and among Aboriginal persons.
- 19.7% of newly reported cases of HIV/AIDS were co-infected with HCV from 1998 to 2001. Of these, the large majority contracted HIV/AIDS through injection drug use and almost half were Aboriginals.
- Of newly reported cases of HCV, 1.1% were co-infected with HIV/AIDS. Amongst these co-infected cases, almost half were of First Nations status.
- Individuals co-infected with HCV made up 21.9% of acute HBV cases, and 21.8% of these co-infected cases were First Nations individuals.

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Appendix I: Map of Geographic Areas

Below is a map of Alberta, showing the four geographic areas used in analyses appearing in this report.

The areas were defined by RHAs (2001 boundaries). Southern Alberta includes residents of RHAs 1, 2, 3, 5, and 6; Calgary area includes residents of RHA 4, Edmonton area includes residents of RHA 10, and Northern Alberta includes residents of RHAs 7 through 9 and 11 through 17.

Alberta

Appendix II: Disease Reporting Forms

1 *HIV/AIDS Case Report Form*

Health Canada / Santé Canada

Protected when completed

HIV/AIDS Case Report
Adult, Adolescent and Pediatric
(non maternal-fetal) Cases

For provincial/territorial use	For use by LCDC
Provincial ID Number	CDC No.
Province to which case is attributed	Date received

HIV AIDS New case report Update

SECTION I - PATIENT INFORMATION

Reporting physician's name | City | Telephone number

Hospital or clinic | City | Province

Is another physician providing ongoing care to this patient? Yes No — If so, please provide name, city and telephone number:

Name | City | Telephone number

Patient's initials: First Middle Last | Sex: M F | Date of birth | Year | Status: Alive (if yes, date not known to be given) / Dead (if yes, date of death)

• **Is the patient: (please ask patient to assist you in answering this question)**

White

Black (e.g. African, Haitian, Jamaican, Somali, etc.)

North American Indian **Métis** **Inuit**

Asian (e.g., Chinese, Japanese, Vietnamese, Cambodian, Indonesian, Laotian, Korean, Filipino, etc.)

South Asian (e.g. East Indian, Pakistani, Sri Lankan, Punjabi, Bangladeshi, etc.)

Arab/West Asian (e.g., Armenian, Egyptian, Iranian, Lebanese, Moroccan, etc.)

Latin-American (e.g. Mexican, Central/South American, etc.)

Other - includes mixed ethnicity (specify):

What language does this person speak most often at home? | **Country of birth**: Canada / Other (specify) | **Year of arrival in Canada**

City and province/territory of residence at diagnosis | Current city and province/territory of residence

SECTION II - RISK(S) ASSOCIATED WITH THE TRANSMISSION OF HIV IN THIS PATIENT

• **Since January 1978 and preceding the diagnosis of HIV/AIDS, this patient had: (check ALL that apply)**

Yes No Unknown

Sex with a male

Sex with a female

Heterosexual sex with: (check ALL that apply)

- an injection drug user.
- a bisexual male.
- a transfusion recipient with documented HIV infection.
- a person with hemophilia/coagulation disorder.
- a person born in a country where heterosexual transmission predominates. **If yes, specify country:**
- a person with confirmed or suspected HIV infection or AIDS (whether or not risk factor is known).

Injected non-prescription drugs (including steroids)

Received pooled concentrates of factor VIII or IX for treatment of hemophilia/coagulation disorder.
If yes, please complete Section 1 of the Supplement to HIV/AIDS Case Report.

Received transfusion of whole blood or blood components such as packed red cells, plasma, platelets or cryoprecipitate.
If yes, please complete Section 2 of the Supplement to HIV/AIDS Case Report.

Exposure to HIV-contaminated blood or body fluids or concentrated virus in an occupational setting. **If yes, specify occupation:**

Other medical exposure (eg. organ or tissue transplant, artificial insemination).
If yes, please give details in Section VI "Additional Information or Comments".

Non-medical, non-occupational exposure which could have been the source of the infection (eg. acupuncture, tattoo, body piercing, breast milk).
If yes, please give details of type of exposure, date and location in Section VI "Additional Information or Comments".

Since January 1978, has this patient donated blood, plasma, gametes, organs, tissues, semen or breast milk? Yes No Unknown
If yes, please give details of type of donation, date and location in Section VI "Additional Information or Comments".

Has the Red Cross or other appropriate donor program been notified? Yes No Unknown

Do you want a public health official to ensure this notification? Yes No Unknown

HIV/AIDS E (98/06)

Distribution: White - Medical Officer of Health Yellow - Ministry of Health Pink - LCDC

Alberta
HEALTH AND WELLNESS

SECTION III - LABORATORY DATA

1. Does this case have evidence, as defined in the above instructions, of HIV infection?

Yes No Unknown

Date of first positive HIV test (if known)

Current CD4 count (if known)

SECTION IV - DISEASES INDICATIVE OF AIDS

DISEASES	Date of Diagnosis Year	Month	Diagnostic method Definitive	Presumptive
Bacterial pneumonia, recurrent				
Candidiasis (bronchi, trachea or lungs)				
Candidiasis (oesophageal)				
Cervical cancer, invasive				
Coccidioidomycosis (disseminated or extrapulmonary)				
Cryptococcosis (extrapulmonary)				
Cryptosporidiosis (chronic intestinal, >1 mo. duration)				
Cytomegalovirus disease (other than in liver, spleen or nodes)				
Cytomegalovirus retinitis (with loss of vision)				
Encephalopathy, HIV-related (dementia)				
Herpes simplex: chronic ulcers (>1 mo. duration) or bronchitis, pneumonitis or oesophagitis				
Histoplasmosis (disseminated or extrapulmonary)				
Isosporiasis, chronic intestinal (>1 mo. duration)				
Kaposi's sarcoma				
Lymphoma, Burkitt's (or equivalent term)				
Lymphoma, immunoblastic (or equivalent term)				
Lymphoma, primary in brain				

DISEASES	Date of Diagnosis Year	Month	Diagnostic method Definitive	Presumptive
Mycobacterium avium complex or M. kansasii (disseminated or extrapulmonary)				
Mycobacterium of other species or unidentified species				
M. tuberculosis (disseminated or extrapulmonary) (Please complete SECTION V)				

Specify Site:

Miliary Pleurisy Other respiratory

C.N.S. Bone and joint Genitourinary

Other (specify) +

M. tuberculosis (pulmonary) (Please complete SECTION V)			
Pneumocystis carinii pneumonia			
Progressive multifocal leukoencephalopathy			
Salmonella septicemia, recurrent			
Toxoplasmosis of brain			
Wasting syndrome due to HIV			

Diseases affecting pediatric cases only (<15 years old)

Bacterial infections, multiple or recurrent (excluding recurrent bacterial pneumonia)			
Lymphoid interstitial pneumonia and/or Pulmonary lymphoid hyperplasia			

SECTION V - TUBERCULOSIS

1. **Before the diagnosis of AIDS, was this patient ever treated for tuberculosis?** Yes - When? → Year Month No Unknown
2. **Has this patient ever had a PPD skin test?** Yes - What was the size in mm → No Unknown
3. **If the PPD test was negative, was the patient anergy tested?** Yes No Unknown If yes, were any skin positive? Yes No Unknown

SECTION VI - ADDITIONAL INFORMATION OR COMMENTS

(Please use this section for information of interest about the acquisition of the virus, etc.)

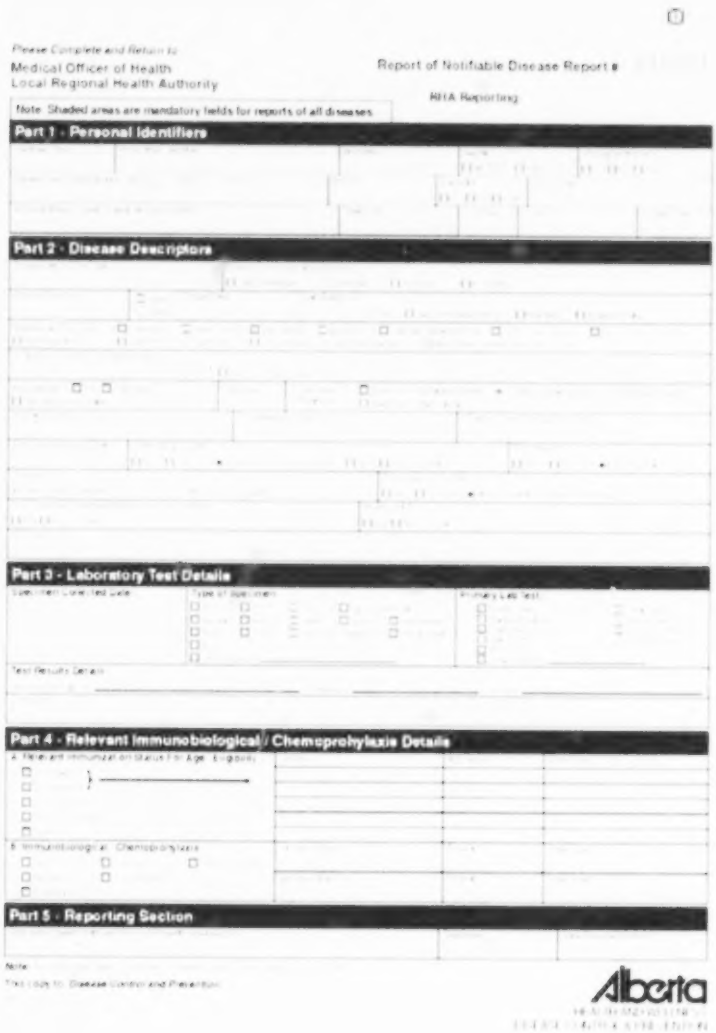
Person completing this form	Telephone number	Date report completed Year Month Day
	( )	

FOR PROVINCIAL/TERRITORIAL USE: To which exposure category has this patient been assigned?

Man who have sex with men (MSM)	Injection drug user (IDU)	MSM and IDU	Heterosexual - Endemic	NR - Heterosexual
Blood transfusion recipient	Clotting factor recipient	Occupational exposure	Heterosexual - Partner at risk	NR - Other

HCSC 4845 (08/91)

2 *Notifiable Disease Report Form*



Please Complete and Return to:
Medical Officer of Health
Local Regional Health Authority

Report of Notifiable Disease Report #

RHA Reporting

Note: Shaded areas are mandatory fields for reports of all diseases

Part 1 - Personal Identifiers

Part 2 - Disease Descriptors

Part 3 - Laboratory Test Details

Type of Specimen

Primary Lab Test

Test Results Details

Part 4 - Relevant Immunobiological / Chemoprophylaxis Details

A. Relevant Immunization Status for Age Eligible

B. Immunobiological / Chemoprophylaxis

Part 5 - Reporting Section

Note:

This copy to: Disease Control and Prevention

Alberta

Lists of data to be used for specific Data Fields

Risk Groups

01 Food Processor / Handler
02 Health Care Worker
03 Care Provider
04 Animal Care Worker
05 Emergency Services Worker
06 Attendees of Special Gatherings
07 IDU (Injection Drug Use)
08 Care Recipient
09 Immigrant
10 None
97 Other, specify
98 Unknown

Outcome

01 Full Recovery
02 Partial Recovery with residual effects
03 Unknown / Outcome Pending
05 Asymptomatic
06 Fatal
07 Lost to Follow-Up

Probable Vehicle of Transmission

01 Food borne
02 Direct Contact
03 Airborne
04 Zoonotic
05 Water borne
06 Wound
08 Sexual contact
11 Blood borne
12 Fecal-Oral
14 Vertical (Mother to baby in utero)
15 Transcutaneous/Transmucosal
97 Other (specify)
98 Unknown

Underlying Conditions / Pertinent History

01 Peripartum
02 Chickenpox
03 Asplenia
04 Immunodeficiency
05 TB
06 HIV
07 Chronic Heart Disease
08 Alcohol Abuse
09 Nosocomial Infection
10 Cancer
11 Diabetes
12 IDU (Injection Drug Use)
13 Chronic Lung Disease
14 Cochlear Implant Recipient
97 Other, specify

Probable Exposure Site

01 Day Care
02 School
03 Food Services Establishment
04 Health Care Facility
05 Foreign Travel
06 Private Dwelling
09 Work Place
10 Campsite
11 Farm
12 Community
13 Animal Facility (ie. petting zoo)
14 Domestic Travel
15 Group Home
16 Recreational Water
17 Aquatic
18 Tattoo / Body Piercing Establishment
97 Other (specify)
98 Unknown

Appendix III: Case Definitions

1 *HIV*

HIV

Source: Health Canada (May, 2000). Canada Communicable Disease Report, 26S3, 71.

Confirmed Case

Laboratory confirmation of infection:

• positive result on a screening test for HIV antibody (e.g., repeatedly reactive enzyme immunoassay) followed by a positive test result on a confirmatory test for HIV antibody (e.g., Western blot or immunoflouresecence antibody test)

2 *AIDS*

AIDS
Source: Health Canada (May, 2000). Canada Communicable Disease Report, 26S3, 61-63.

Confirmed Case
One or more of the specified indicator diseases[1] definitively diagnosed
AND
a positive test for HIV infection

NOTE: Additional information on diagnostic criteria (sufficient for surveillance purposes) for the indicator diseases are provided on the back of the HIV/AIDS Case Report Form (see Appendix H).

1 Indicator Diseases for Adults and Adolescents > 15 years of Age
Bacterial pneumonia (recurrent)*
Candidiasis (bronchi, trachea or lungs)
Candidiasis (esophageal) †
Cervical cancer (invasive)*
Coccidioidomycosis (disseminated or extrapulmonary)*
Cryptococcosis (extrapulmonary)
Cryptosporidiosis chronic intestinal(> 1 month duration)
Cytomegalovirus diseases (other than in liver, spleen or nodes)
Cytomegalovirus retinitis (with loss of vision)*, †
Encephalopathy, HIV-related (dementia)*
Herpes simplex: chronic ulcer(s) (> 1 month duration) or bronchitis, pneumonitis or esophagitis
Histoplasmosis (disseminated or extrapulmonary)*
Isosporiasis, chronic intestinal (> 1 month duration)*
Kaposi's sarcoma†
Lymphoma, Burkitt's (or equi˙alent term)*
Lymphoma, immunoblastic (or equivalent term)*
Lymphoma (primary in brain)
Mycobacterium avium complex or M. kansasii (disseminated or extrapulmonary)*
Mycobacterium of other species or unidentified species*, †
M. tuberculosis (disseminated or extrapulmonary)*
M. tuberculosis (pulmonary)*
Pneumocystis carinii pneumonia†
Progressive multifocal leukoencephalopathy
Salmonella septicemia (recurrent)*
Toxoplasmosis of brain†
Wasting syndrome due to HIV*

For pediatric cases only (< 15 years old)
Bacterial infections (multiple or recurrent, excluding recurrent bacterial pneumonia)*
Lymphoid interstitial pneumonia and/or pulmonary lymphoid hyperplasia†

* must have laboratory evidence of HIV infection
† may be diagnosed presumptively if laboratory evidence of HIV infections is present

3 *HCV*

HCV

Source: Health Canada (May, 2000). Canada Communicable Disease Report, 26S3, 69.

Confirmed Case

Laboratory confirmation of infection with/without symptoms:

- if < 1 year of age[1]:
  - hepatitis C virus RNA PCR[2] positive regardless of the result of testing for antibody to hepatitis C virus (anti-HCV)[3]
- if ≥ 1 year of age:
  - anti-HCV positive[4] OR
  - hepatitis C virus RNA PCR positive[5], if anti-HCV negative

Probable Case

Hepatitis C RNA positive by PCR[2,5]

1 Cord blood should not be used because of maternal blood contamination.
2 Optimum time after birth for HCV RNA PCR testing is undefined. Testing at 4-6 weeks and/or at 6 months to 1 year is recommended.
3 HCV antibody testing should not be performed in infants < 1 year of age because of detectable levels of maternal antibody; however, if antibody testing is performed and found to be reactive at 1 year of age, PCR testing should be performed to rule out maternal antibody and to confirm viremia.
4 Positive tests should be confirmed by dual EIA testing or by immunoblot/PCR based testing.
5 PCR testing should be performed only in anti-HCV negative individuals when clinically indicated.

4 *Acute HBV*

Acute HBV
Source: Health Canada (May, 2000). Canada Communicable Disease Report, 26S3, 97.

Confirmed Case
Laboratory confirmation of infection:

- Hepatitis B surface antigen (HBsAg) positive and immunoglobulin M (IgM) antibody to hepatitis B core antigen (anti-HBc) positive OR
- Loss of HBsAg over 6 months in the context of a compatible clinical history or probable exposure OR
- Acute clinical illness[1] and HBsAg positive (and anti-HAV negative and anti-HCV negative) when the test for IgM antibody to anti-HBc is not available

Probable Case
Acute clinical illness[1] in a person who is epidemiologically linked to a confirmed case

1 Acute clinical illness is characterized by a discrete onset of symptoms and jaundice or elevated serum aminotransferase levels.

5 *Chronic HBV*

Chronic HBV

Source: Health Canada (May, 2000). Canada Communicable Disease Report, 26S3, 99.

Confirmed Case

Laboratory confirmation of infection with/without symptoms:

- persistence of HBsAg positivity for more than 6 months OR
- HBsAg positivity in a person who is immunoglobulin G (IgG) antibody to hepatitis B core antigen (anti-HBc-IgG) positive and immunoglobulin M (IgM) antibody to hepatitis B core antigen (anti-HBc-IgM) negative

Appendix IV: Coding of HCV, HBV, and Chronic Liver Disease

Below are ICD codes used in the extraction of hepatitis C and B death data from Vital Statistics.
Source: Pohani, Zou, and Tepper (2001) (see Reference #31).

Description of Disease	ICD-9	ICD-10
HCV		
Other specified viral hepatitis with hepatic coma	070.4	B19.0
Other specified viral hepatitis without hepatic coma	070.5	B19.1
Viral hepatitis with hepatic coma, NS	070.6	B17.1, B18.2, B18.8
Viral hepatitis without hepatic coma, NS	070.9	B17.8, B18.9
HBV		
Viral hepatitis B with hepatic coma	070.2	B16.0-B16.1
Viral hepatitis B without hepatic coma	070.3	B16.2, B16.9, B17.0, B18.0-B18.1
Chronic Liver Disease		
Liver cancer	155.0	C22
Alcoholic cirrhosis of liver	571.2	K70.3
Alcoholic liver damage, NS	571.3	K70.9, K70.4
Chronic hepatitis	571.4	K73
Nonalcoholic cirrhosis of Liver	571.5	K74.6
Other chronic nonalcoholic liver disease	571.8	K76.0-K76.5
Nonalcoholic liver disease, NS	571.9	K76.9
Hepatic coma	572.2	K72
Portal hypertension	572.3	K76.6
Hepatorenal syndrome	572.4	K76.7
Other sequelae of chronic liver disease	572.8	K76.8, K77.8

Appendix V: Tables

Table 1. Missing Data (Percent) for HIV, AIDS, HCV, and Acute HBV Infections

Pathogen	Years	Sex	Age	Ethnicity[1]	Aboriginal Ethnicity[2]	First Nations status[2]	Exposure Category	Reporting Date
HIV	1998-2001	0.0	0.0	0.9	0.0	N/A	0.0	0.0
AIDS	1986-2001	0.0	0.0	84.4	0.1	N/A	1.4	0.0
HCV	1998-2001	1.4	1.0	N/A	N/A	7.2[3]	N/A	0.2
HBV	1986-2001	0.2	6.3	N/A	N/A	N/A	N/A	3.5
	1998-2001	1.2	0.9	N/A	N/A	4.3[3]	N/A	0.6

Notes:

[1] Ethnicity is reported on the HIV/AIDS Case Report form. This does not apply to HCV and HBV.

[2] For HIV/AIDS, aboriginal ethnicity is extracted from responses in the Ethnicity category on the HIV/AIDS Case Report Form. For HCV and HBV, First Nations Status was obtained by linkage to the Alberta Stakeholder Registry Population Files due to unreliable use of this category by those filling out the form.

[3] For HCV and HBV, First Nations status missing data are reported for 1998 to 2001.

Sources:

Alberta Health and Wellness. The Alberta Stakeholder Registration Population Files.
Alberta Health and Wellness. The Alberta Health Care Insurance Plan Registry.
Alberta Health and Wellness. CDRS.

Table 2. Rate of Newly Reported HIV Infections by Sex, Alberta, 1998*-2001

Year of Reporting	Males				Females				All Sexes (including sex missing)			
	Reported Cases	% of Sex (row %) [1]	Rate [2]	Age-Adjusted Rate [3]	Reported Cases	% of Sex (row %) [1]	Rate [2]	Age-Adjusted Rate [3]	Annual Total Cases	Cumulative Cases [4]	Rate [2]	Age-Adjusted Rate [3]
1998	74	63.2	5.2	5.3	43	36.8	3.0	3.0	117	117	4.1	4.1
1999	117	73.1	8.0	8.2	43	26.9	2.9	2.9	160	277	5.5	5.5
2000	126	66.0	8.5	8.9	65	34.0	4.4	4.4	191	468	6.4	6.6
2001	123	72.8	8.2	8.4	46	27.2	3.0	3.0	169	637	5.6	5.7
1998-2001	440	69.1	7.5	7.7	197	30.9	3.3	3.3	637		5.4	5.5

Notes:

[1] The proportion of males or females in total cases with known sex.

[2] The number of newly reported cases per 100,000 population at risk.

[3] The number of newly reported cases adjusted by the age distribution of the 1996 Canadian census population per 100,000 population at risk.

[4] The cumulative number of newly reported cases.

*HIV became reportable as of May 1998, so 1998 data may be incomplete.

Sources: 1). Alberta Health and Wellness. CDRS. November 30, 2002 release.

2). Alberta Health and Wellness. The Alberta Stakeholder Registry Population based mid-year population. November 15, 2002 release.

Table 3. Rate of Newly Reported AIDS Cases by Sex, Alberta, 1986-2001

Year of Reporting	Males				Females				All Sexes (including sex missing)			
	Reported Cases	% of Sex (row %) [1]	Rate [2]	Age-Adjusted Rate [3]	Reported Cases	% of Sex (row %) [1]	Rate [2]	Age-Adjusted Rate [3]	Annual Total Cases	Cumulative Cases [4]	Rate [2]	Age-Adjusted Rate [3]
1986	20	90.9	1.6	1.7	2	9.1	0.2	0.2	22	22	0.9	0.9
1987	35	94.6	2.8	2.8	2	5.4	0.2	0.2	37	59	1.5	1.5
1988	48	94.1	3.8	3.8	3	5.9	0.2	0.3	51	110	2.1	2.0
1989	81	96.4	6.4	6.8	3	3.6	0.2	0.3	84	194	3.3	3.6
1990	80	98.8	6.2	6.3	1	1.2	0.1	0.1	81	275	3.1	3.2
1991	82	96.5	6.3	6.7	3	3.5	0.2	0.2	85	360	3.3	3.4
1992	91	93.8	6.9	6.9	6	6.2	0.5	0.4	97	457	3.7	3.6
1993	90	96.8	6.7	6.8	3	3.2	0.2	0.2	93	550	3.5	3.5
1994	111	91.0	8.3	8.3	11	9.0	0.8	0.8	122	672	4.5	4.5
1995	98	98.0	7.3	7.3	2	2.0	0.2	0.1	100	772	3.7	3.7
1996	71	91.0	5.2	5.3	7	9.0	0.5	0.5	78	850	2.9	2.9
1997	48	88.9	3.5	3.6	6	11.1	0.4	0.4	54	904	1.9	2.0
1998	23	92.0	1.6	1.7	2	8.0	0.1	0.1	25	929	0.9	0.9
1999	40	95.2	2.7	2.8	2	4.8	0.1	0.1	42	971	1.4	1.4
2000	42	87.5	2.8	2.9	6	12.5	0.4	0.4	48	1,019	1.6	1.6
2001	37	88.1	2.5	2.6	5	11.9	0.3	0.3	42	1,061	1.4	1.4
1986-2001	997	94.0	4.6	4.7	64	6.0	0.3	0.3	1,061		2.5	2.5

Notes:

[1] The proportion of males or females in total cases with known sex.

[2] The number of newly reported cases per 100,000 population at risk.

[3] The number of newly reported cases adjusted by the age distribution of the 1996 Canadian census population per 100,000 population at risk.

[4] The cumulative number of newly reported cases.

Sources: 1). Alberta Health and Wellness. CDRS. November 30, 2002 release.

2). Alberta Health and Wellness. The Alberta Stakeholder Registry Population based mid-year population. November 15, 2002 release.

Table 4. Age-Specific Rate of Newly Reported HIV Infections by Sex, Alberta, 1998*-2001

Age at Reporting (year)	Males			Females			All Sexes (including sex missing)		
	Reported Cases	% of Age Group[1]	Rate[2]	Reported Cases	% of Age Group[1]	Rate[2]	Reported Cases	% of Age Group[1]	Rate[2]
0 - 14	2	0.5	0.2	0	0.0	-	2	0.3	0.1
15 - 19	2	0.5	0.4	11	5.6	2.6	13	2.0	1.5
20 - 24	23	5.2	5.5	38	19.3	9.3	61	9.6	7.4
25 - 29	57	13.0	13.4	39	19.8	9.2	96	15.1	11.3
30 - 34	91	20.7	20.4	42	21.3	9.3	133	20.9	14.9
35 - 39	109	24.8	21.0	31	15.7	5.9	140	22.0	13.4
40 - 44	69	15.7	13.1	23	11.7	4.5	92	14.4	8.8
45 - 49	50	11.4	11.3	9	4.6	2.1	59	9.3	6.8
50 - 54	16	3.6	4.5	1	0.5	0.3	17	2.7	2.4
55 - 59	9	2.0	3.5	3	1.5	1.2	12	1.9	2.3
60 - 64	8	1.8	3.9	0	0.0	-	8	1.3	1.9
65+	4	0.9	0.8	0	0.0	-	4	0.6	0.3
Unknown	0	0.0	-	0	0.0	-	0	0.0	-
All Ages	440	100.0	7.5	197	100.0	3.3	637	100.0	5.4

Notes:

[1] The proportion of total cases in each age group.

[2] The number of newly reported cases per 100,000 population at risk.

*HIV became reportable as of May 1998, so 1998 data may be incomplete.

Sources:

1). Alberta Health and Wellness. CDRS. November 30, 2002 release.

2). Alberta Health and Wellness. The Alberta Stakeholder Registry Population based mid-year population. November 15, 2002 release.

Table 5. Age-Specific Rate of Newly Reported AIDS Cases by Sex, Alberta, 1986-2001

Age at Reporting (year)	Males			Females			All Sexes (including sex missing)		
	Reported Cases	% of Age Group[1]	Rate[2]	Reported Cases	% of Age Group[1]	Rate[2]	Reported Cases	% of Age Group[1]	Rate[2]
0 - 14	2	0.2	-	3	4.7	0.1	5	0.5	0.1
15 - 19	4	0.4	0.2	0	0.0	-	4	0.4	0.1
20 - 24	29	2.9	1.8	6	9.4	0.4	35	3.3	1.1
25 - 29	135	13.5	7.4	11	17.2	0.6	146	13.8	4.0
30 - 34	236	23.7	12.1	14	21.9	0.7	250	23.6	6.4
35 - 39	201	20.2	10.4	10	15.6	0.5	211	19.9	5.5
40 - 44	164	16.4	9.7	4	6.3	0.2	168	15.8	5.0
45 - 49	97	9.7	7.1	3	4.7	0.2	100	9.4	3.7
50 - 54	61	6.1	5.6	3	4.7	0.3	64	6.0	3.0
55 - 59	29	2.9	3.3	4	6.3	0.5	33	3.1	1.9
60 - 64	19	1.9	2.5	3	4.7	0.4	22	2.1	1.5
65+	20	2.0	1.1	3	4.7	0.1	23	2.2	0.6
Unknown	0	0.0	-	0	0.0	-	0	0.0	-
All Ages	997	100.0	4.6	64	100.0	0.3	1,061	100.0	2.5

Notes:

[1] The proportion of total cases in each age group.

[2] The number of newly reported cases per 100,000 population at risk.

Sources:

1). Alberta Health and Wellness. CDRS. November 30, 2002 release.

2). Alberta Health and Wellness. The Alberta Stakeholder Registry Population based mid-year population. November 15, 2002 release.

Table 6. Rate of Newly Reported HIV Infections by Sex and Geographic Area, Alberta, 1999-2001

Area of Residence	Males						Females						All Sexes (including sex missing)					
	Reported Cases	% of Total (Col. %) [1]	Rate [2]	Adjusted Rate and 95% CI [3]			Reported Cases	% of Total (Col. %) [1]	Rate [2]	Adjusted Rate and 95% CI [3]			Reported Cases	% of Total (Col. %) [1]	Rate [2]	Adjusted Rate and 95% CI [3]		
				Rate	Lower	Upper				Rate	Lower	Upper				Rate	Lower	Upper
Southern Alberta	42	11.5	5.0	5.6	3.9	7.3	9	5.8	1.1	1.2	0.4	1.9	51	9.8	3.0	3.4	2.4	4.3
Calgary Area	139	38.0	9.9	9.5	8.0	11.1	36	23.4	2.5	2.4	1.6	3.2	175	33.7	6.2	5.9	5.1	6.8
Edmonton Area	149	40.7	12.1	12.1	10.1	14.0	78	50.6	6.2	6.2	4.8	7.5	227	43.7	9.1	9.1	7.9	10.3
Northern Alberta	36	9.8	3.7	4.3	2.9	5.7	31	20.1	3.3	3.4	2.2	4.6	67	12.9	3.5	3.8	2.9	4.8
	Differences in rate across area [4]			**p < .05**						**p < .05**						**p < .05**		
Alberta	366	100.0	8.2	8.5	7.6	9.4	154	100.0	3.5	3.5	2.9	4.0	520	100.0	5.8	5.9	5.4	6.5

Notes:

[1] The proportion of total cases per area of the province.

[2] The number of newly reported cases per 100,000 population at risk.

[3] The number of newly reported cases adjusted by the age distribution of the 1996 Canadian census population per 100,000 population at risk.

[4] Test for difference in the age-adjusted rate across geographic areas.

Sources:

1). Alberta Health and Wellness. CDRS. November 30, 2002 release.

2). Alberta Health and Wellness. The Alberta Alberta Stakeholder Registry Population based mid-year population. November 15, 2002 release.

Table 7. Rate of Newly Reported AIDS Cases by Sex and Geographic Area, Alberta, 1999-2001

Area of Residence	Males						All Sexes (including sex missing)					
	Reported Cases	% of Total (Col. %) [1]	Rate [2]	Adjusted Rate and 95% CI [3] Rate	Lower	Upper	Reported Cases	% of Total (Col. %) [1]	Rate [2]	Adjusted Rate and 95% CI [3] Rate	Lower	Upper
Southern Alberta	9	7.6	1.1	1.1	0.4	1.9	10	7.6	0.6	0.6	0.2	1.0
Calgary Region	67	56.3	4.8	4.6	3.5	5.7	76	57.6	2.7	2.6	2.0	3.1
Edmonton Region	32	26.9	2.6	2.6	1.7	3.5	34	25.8	1.4	1.3	0.9	1.8
Northern Alberta	11	9.2	1.1	1.3	0.5	2.0	12	9.1	0.6	0.7	0.3	1.1
	Differences in rate across area[4]			**p < .05**							**p < .05**	
Alberta	119	100.0	2.7	2.7	2.2	3.2	132	100.0	1.5	1.5	1.2	1.8

Notes:

[1] The proportion of total cases per area of the province.

[2] The number of newly reported cases per 100,000 population at risk.

[3] The number of newly reported cases adjusted by the age distribution of the 1996 Canadian census population per 100,000 population at risk.

[4] Test for difference in the age-adjusted rate across geographic areas.

Sources:

1). Alberta Health and Wellness. CDRS. November 30, 2002 release.

2). Alberta Health and Wellness. The Alberta Stakeholder Registry Population based mid-year population. November 15, 2002 release.

Table 8. Newly Reported HIV Infections by Sex and Exposure Category and Year of Reporting, Alberta, 1998*-2001

Year of Reporting	MSM/IDU						Heterosexual Contact				Blood/Clotting Factor		Mother-to-child/ Pediatric/Occupational				Unknown				All Categories Combined	
	MSM		MSM-IDU		IDU		Endemic		Other				Mother-to-child/ Pediatric		Occupational		NIR - Other		Unknown			
	N	%†	N	%†	N	%†	N	%†	N	%†	N	%†	N	%†	N	%†	N	%†	N	%†	N	%‡
Males																						
1998	27	36.5	4	5.4	29	39.2	2	2.7	10	13.5	0.0	0.0	1	1.4	0	0.0	1	1.4	0	0.0	74	16.8
1999	38	32.5	6	5.1	38	32.5	9	7.7	25	21.4	0.0	0.0	0	0.0	0	0.0	1	0.9	0	0.0	117	26.6
2000	52	41.3	2	1.6	45	35.7	5	4.0	21	16.7	0.0	0.0	1	0.8	0	0.0	0	0.0	0	0.0	126	28.6
2001	36	29.3	6	4.9	43	35.0	8	6.5	28	22.8	0.0	0.0	0	0.0	0	0.0	2	1.6	0	0.0	123	28.0
1998-2001	**153**	**34.8**	**18**	**4.1**	**155**	**35.2**	**24**	**5.5**	**84**	**19.1**	**0.0**	**0.0**	**2**	**0.5**	**0**	**0.0**	**4**	**0.9**	**0**	**0.0**	**440**	**100.0**
Females																						
1998	0	-	0	-	21	48.8	4	9.3	13	30.2	0.0	0.0	0	0.0	0	0.0	5	11.6	0	0.0	43	21.8
1999	0	-	0	-	26	60.5	9	20.9	8	18.6	0.0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	43	21.8
2000	0	-	0	-	34	52.3	9	13.8	21	32.3	0.0	0.0	0	0.0	0	0.0	1	1.5	0	0.0	65	33.0
2001	0	-	0	-	23	50.0	10	21.7	13	28.3	0.0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	46	23.4
1998-2001	**0**	-	**0**	-	**104**	**52.8**	**32**	**16.2**	**55**	**27.9**	**0.0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**6**	**3.0**	**0**	**0.0**	**197**	**100.0**

Notes: † The proportion of total newly reported cases per exposure category in a year-time period (row percent)
‡ The proportion of total newly reported cases per year (column percent)
*HIV became reportable as of May 1998, so 1998 data may be incomplete

Source: Alberta Health and Wellness, CDRS, November 30, 2002 release.

Table 9. Newly Reported AIDS Cases by Sex and Exposure Category, Alberta, 1986-2001

Sex	MSM/IDU						Heterosexual Contact				Blood/Clotting Factor		Mother-to-child/ Pediatric/Occupational				Unknown				All Categories Combined	
	MSM		MSM-IDU		IDU		Endemic Area		Other				Mother-to-child/ Pediatric		Occupational		Other		Unknown			
	N	%[1]	N	%[1]	N	%[1]	N	%[1]	N	%[1]	N	%[1]	N	%[1]	N	%[1]	N	%[1]	N	%[1]	N	%[2]
Male	798	80.0	11	1.1	54	5.4	10	1.0	73	7.3	33	3.3	1	0.1	0	0.0	3	0.3	15	1.5	998	100.0
Female	0	-	0	-	19	29.7	4	6.3	31	48.4	7	10.9	3	4.7	0	0.0	0	0.0	0	0.0	64	100.0

Notes: [1] The proportion of total newly reported cases per exposure category in a year/time period (row percent)
[2] The proportion of total newly reported cases per year (column percent)

Source: Alberta Health and Wellness. CDRS. November 30, 2002 release

Table 10. Newly Reported HIV Infections by Geographic Area and Exposure Category, Alberta, 1998*-2001

Area of Residence	MSM/IDU						Heterosexual Contact				Blood/Clotting Factor		Mother-to-child/Pediatric/ Occupational				Unknown				All Categories Combined	
	MSM		MSM-IDU		IDU		Endemic		Other				Mother-to-child/ Pediatric		Occupational		Other		Unknown			
	N	%[1]	N	%[1]	N	%[1]	N	%[1]	N	%[1]	N	%[1]	N	%[1]	N	%[1]	N	%[1]	N	%[1]	N	%[2]
Southern Alberta	14	23.0	3	4.9	17	27.9	7	11.5	16	26.2	0	0.0	1	1.6	0	0.0	3	4.9	0	0.0	61	100.0
Calgary Area	92	41.1	5	2.2	73	32.6	17	7.6	35	15.6	0	0.0	1	0.4	0	0.0	1	0.4	0	0.0	224	100.0
Edmonton Area	43	15.4	9	3.2	137	49.1	29	10.4	56	20.1	0	0.0	0	0.0	0	0.0	5	1.8	0	0.0	279	100.0
Northern Alberta	4	5.5	1	1.4	32	43.8	3	4.1	32	43.8	0	0.0	0	0.0	0	0.0	1	1.4	0	0.0	73	100.0
Alberta	153	24.0	18	2.8	259	40.7	56	8.8	139	21.8	0	0.0	2	0.3	0	0.0	10	1.6	0	0.0	637	100.0

Notes:

[1] The proportion of total newly reported cases per exposure category in a year/time period (row percent).

[2] The proportion of total newly reported cases per year (column percent).

*HIV became reportable as of May 1998, so 1998 data may be incomplete.

Source: Alberta Health and Wellness. The CDRS. November 30, 2002 release.

Table 11. Newly Reported AIDS Cases by Geographic Area and Exposure Category, Alberta, 1986-2001

Area of Residence	MSM/IDU						Heterosexual Contact				Blood/Clotting Factor		Transfusion or Clotting Factor				Mother-to-child/Pediatric/ Occupational				Unknown				All Categories Combined	
	MSM		MSM-IDU		IDU		Endemic		Other				Clotting Factor		Transfusion		Mother-to-child/ Pediatric		Occupational		Other		Unknown			
	N	%[1]	N	%[1]	N	%[1]	N	%[1]	N	%[1]	N	%[1]	N	%[1]	N	%[1]	N	%[1]	N	%[1]	N	%[1]	N	%[1]	N	%[2]
Southern Alberta	55	71.4	1	1.3	7	9.1	0	0.0	5	6.5	7	9.1	0	0.0	7	9.1	1	1.3	0	0.0	0	0.0	1	1.3	77	100.0
Calgary Area	478	79.0	6	1.0	25	4.1	9	1.5	57	9.4	19	3.1	8	1.3	11	1.8	1	0.2	0	0.0	2	0.3	8	1.3	605	100.0
Edmonton Area	245	72.9	4	1.2	31	9.2	5	1.5	31	9.2	13	3.9	7	2.1	6	1.8	2	0.6	0	0.0	1	0.3	4	1.2	336	100.0
Northern Alberta	20	46.5	0	0.0	7	16.3	0	0.0	12	27.9	2	4.7	1	2.3	1	2.3	0	0.0	0	0.0	0	0.0	2	4.7	43	100.0
Alberta	798	75.2	11	1.0	70	6.6	14	1.3	105	9.9	41	3.9	16	1.5	25	2.4	4	0.4	0	0.0	3	0.3	15	1.4	1061	100.0

Notes:

[1] The proportion of total newly reported cases per exposure category in a year/time period (row percent).

[2] The proportion of total newly reported cases per year (column percent).

Source: Alberta Health and Wellness. CDRS. November 30, 2002 release.

Table 12. Newly Reported HIV Infections by Geographic Area and Ethnicity, Alberta, 1998*-2001

Area of Residence	Caucasian		Aboriginal		African-Canadian		Asian		Latin-American		Other Ethnicity		Ethnicity Unknown		All Ethnicities	
	N	%[1]	N	%[1]	N	%[1]	N	%[1]	N	%[1]	N	%[1]	N	%[1]	N	%[2]
Southern Alberta	37	60.7	18	29.5	4	6.6	0	0.0	0	0.0	0	0.0	2	3.3	61	100.0
Calgary Area	158	70.5	29	12.9	20	8.9	13	5.8	2	0.9	0	0.0	2	0.9	224	100.0
Edmonton Area	138	49.5	96	34.4	33	11.8	5	1.8	2	0.7	0	0.0	5	1.8	279	100.0
Northern Alberta	26	35.6	43	58.9	3	4.1	0	0.0	0	0.0	0	0.0	1	1.4	73	100.0
Alberta	359	56.4	186	29.2	60	9.4	18	2.8	4	0.6	0	0.0	10	1.6	637	100.0

Notes:

[1] The proportion of total newly reported cases per exposure category in a year/time period (row percent).

[2] The proportion of total newly reported cases per year (column percent).

*HIV became reportable as of May 1998, so 1998 data may be incomplete.

Source: Alberta Health and Wellness, CDRS, November 30, 2002 release.

Table 13. Percent of Women Receiving Prenatal Care Who Were Tested or Who Declined Testing for HIV Infection, and HIV Infections, Alberta, Sep. 1998 - Aug. 2002

Time Period	Women Eligible for Testing [1]	Women Tested		Women Declined Testing		HIV Infections	
		N [2]	%	N [3]	Proportion (%)	N [4]	Rate [5]
Sep 1998 - Aug 1999	47,606	43,907	92.2	1,904	4.0	15	0.40
Sep 1999 - Aug 2000	42,522	39,729	93.4	988	2.3	18	0.47
Sep 2000 - Aug 2001	41,026	39,872	97.2	563	1.4	21	0.57
Sep 2001 - Aug 2002	38,988	38,011	97.5	731	1.9	18	0.48
Sep 1998 - Aug 2002	**170,142**	**161,519**	**94.9**	**4,186**	**2.5**	**72**	**0.48**
Chi-square test for linear trend			**p < 0.001**		**p < 0.001**		**p > .05**

Notes:

[1] Pregnant women receiving prenatal care with a proper Requisition Form and registered with the Alberta Health Care Insurance Plan. Each woman was counted only once in a 12 month period.

[2] Pregnant women who received an HIV screening test during the 12 month period. Repeated tests were excluded.

[3] The estimated number of pregnant women who declined HIV testing, excluding women who were not registered with the Alberta Health Care Insurance Plan at the time of receiving prenatal care.

[4] The number of pregnant women confirmed positive for HIV for the first time by Provincial Lab for Public Health and/or with a Sep. 2001 and Aug. 2002 and three between Sep. 1999 and Aug. 2000.

[5] The number of pregnant women with confirmed HIV positive per 1,000 liveborns in Alberta.

Sources:

1) Canadian Blood Services (CBS). Alberta Routine Prenatal Care Blood Testing Database. Oct. 2002 release.
2) Alberta Health and Wellness. CDRS. November 2002 release
3) Alberta Registries. Alberta Birth Registry Database. January 2003 release

Table 14. Number of Deaths from AIDS, Death in First Year after Diagnosis, and Age at Death, by Year, Alberta, 1986-2001

Year	Reported Deaths[1]	Death in First Year after Diagnosis[2]	Proportion that Died in the First Year[3]	Mean Age at Death	
				Crude	Adjusted[4]
1986	17	12	50.0	35.6	32.2
1987	27	13	30.2	37.4	33.5
1988	31	12	18.5	39.0	34.2
1989	51	14	16.9	40.3	34.2
1990	45	14	18.7	41.6	35.0
1991	75	19	23.2	40.2	36.3
1992	76	28	28.0	41.2	37.1
1993	71	22	23.2	39.7	37.8
1994	95	26	19.4	39.9	38.6
1995	86	16	17.4	38.6	39.3
1996	62	15	23.4	41.7	40.0
1997	17	5	10.4	34.0	40.9
1998	13	2	6.5	41.0	41.4
1999	13	5	14.3	41.1	43.2
2000	18	8	16.0	39.5	43.5
2001	11	4	10.3	49.2	44.7
1986-2001	708	215	20.0	40.1	40.1

Notes:

[1] Number of deaths of AIDS cases reported to CDRS.

[2] The number of newly reported AIDS cases who died in the first year after diagnosis.

[3] The proportion of newly reported AIDS cases who died in the 1st year among all cases reported in that year.

[4] The average age at death adjusted for the effects of age at reporting, year of diagnosis, exposure category, sex, and ethnicity. The general linear model (GLM) was used.

Sources:

1). Alberta Health and Wellness. CDRS. November 30, 2002 release.

2). Alberta Health and Wellness. The Death Registry of Notifiable Diseases. November 30, 2002 release.

Table 15. Rate of Newly Reported HCV Infections by Sex, Alberta, 1998-2001

Year of Reporting	Males				Females				All Sexes (including sex missing)			
	Reported Cases	% of Sex (row %) [1]	Rate [2]	Age-Adjusted Rate [3]	Reported Cases	% of Sex (row %) [1]	Rate [2]	Age-Adjusted Rate [3]	Annual Total Cases	Cumulative Cases [4]	Rate [2]	Age-Adjusted Rate [3]
1998	1,842	62.8	129.4	129.5	1,091	37.2	76.3	75.1	2,933	2,933	102.8	102.0
1999	1,728	65.1	118.4	118.5	925	34.9	63.2	62.3	2,653	5,586	90.8	90.2
2000	1,401	63.2	94.5	93.9	815	36.8	54.9	53.8	2,216	7,802	74.7	73.7
2001	1,422	64.9	94.2	92.8	769	35.1	50.8	49.9	2,191	9,993	72.5	71.2
1998-2001	6,393	64.0	108.8	108.6	3,600	36.0	61.1	60.2	9,993		84.9	84.2

Notes:

[1] The proportion of males or females in total cases with known sex.

[2] The number of newly reported cases per 100,000 population at risk.

[3] The number of newly reported cases adjusted by the age distribution of the 1996 Canadian census population per 100,000 population at risk.

[4] The cumulative number of newly reported cases.

Sources: 1). Alberta Health and Wellness. CDRS. November 30, 2002 release.

2). Alberta Health and Wellness. The Alberta Stakeholder Registry Population based mid-year population. November 15, 2002 release.

Table 16. Age-Specific Rate of Newly Reported HCV Infections by Sex, Alberta, 1998-2001

Age at Reporting (year)	Males			Females			All Sexes (including sex missing)		
	Reported Cases	% of Age Group[1]	Rate[2]	Reported Cases	% of Age Group[1]	Rate[2]	Reported Cases	% of Age Group[1]	Rate[2]
1 - 4	2	0.0	0.6	2	0.1	0.7	4	0.0	0.6
5 - 9	8	0.1	1.8	5	0.1	1.2	13	0.1	1.5
10 - 14	21	0.3	4.6	10	0.3	2.3	31	0.3	3.5
15 - 19	51	0.8	11.4	103	2.9	24.1	154	1.5	17.6
20 - 24	233	3.6	55.8	214	5.9	52.1	447	4.5	54.0
25 - 29	564	8.8	133.1	396	11.0	93.7	960	9.6	113.4
30 - 34	886	13.9	199.0	505	14.0	112.1	1,391	13.9	155.3
35 - 39	1,143	17.9	220.0	647	18.0	122.3	1,790	17.9	170.7
40 - 44	1,380	21.6	261.9	718	19.9	139.1	2,098	21.0	201.2
45 - 49	1,187	18.6	267.2	462	12.8	107.8	1,649	16.5	188.9
50 - 54	441	6.9	123.8	165	4.6	47.5	606	6.1	86.1
55 - 59	148	2.3	57.1	86	2.4	33.9	234	2.3	45.7
60 - 64	89	1.4	43.4	70	1.9	34.1	159	1.6	38.7
65 - 69	67	1.0	36.8	47	1.3	25.3	114	1.1	31.0
70 - 74	49	0.8	33.7	41	1.1	25.1	90	0.9	29.1
75 - 79	40	0.6	39.5	33	0.9	24.2	73	0.7	30.7
80 - 84	18	0.3	30.9	29	0.8	31.2	47	0.5	31.1
85 - 89	10	0.2	36.4	14	0.4	25.6	24	0.2	29.2
90+	6	0.1	54.2	5	0.1	17.2	11	0.1	27.4
Unknown	50	0.8		48	1.3		98	1.0	
All Ages	6,393	100.0	110.2	3,600	100.0	61.9	9,993	100.0	86.0

Notes:

[1] The proportion of total cases in each age group.

[2] The number of newly reported cases per 100,000 population at risk.

Sources:

1). Alberta Health and Wellness. CDRS. November 30, 2002 release.

2). Alberta Health and Wellness. The Alberta Stakeholder Registry Population based mid-year population. November 15, 2002 release.

Table 17. Rate of Newly Reported HCV Infections by Sex and Geographic Area, Alberta, 1999-2001

Area of Residence	Males						Females						All Sexes (including sex missing)					
	Reported Cases	% of Total (Col. %) [1]	Rate [2]	Adjusted Rate and 95% CI [3]			Reported Cases	% of Total (Col. %) [1]	Rate [2]	Adjusted Rate and 95% CI [3]			Reported Cases	% of Total (Col. %) [1]	Rate [2]	Adjusted Rate and 95% CI [3]		
				Rate	Lower	Upper				Rate	Lower	Upper				Rate	Lower	Upper
Southern Alberta	854	18.8	101.6	108.3	100.9	115.6	353	14.1	42.0	43.2	38.6	47.7	1,207	17.1	71.7	75.3	71.0	79.6
Calgary Area	1,251	27.5	88.7	83.0	78.3	87.6	717	28.6	50.6	47.6	44.1	51.1	1,968	27.9	69.6	65.2	62.3	68.1
Edmonton Area	1,726	37.9	139.8	137.3	130.7	143.8	1,063	42.4	84.4	82.3	77.3	87.3	2,789	39.5	111.9	109.5	105.4	113.6
Northern Alberta	720	15.8	74.6	79.8	73.9	85.6	376	15.0	39.9	41.3	37.0	45.5	1,096	15.5	57.4	60.4	56.8	64.0
	Differences in rate across area [4]			**p < .05**						**p < .05**						**p < .05**		
Alberta	4,551	100.0	102.2	101.8	98.8	104.7	2,509	100.0	56.2	55.3	53.1	57.5	7,060	100.0	79.2	78.4	76.5	80.2

Notes:

[1] The proportion of total cases per area of the province

[2] The number of newly reported cases per 100,000 population at risk

[3] The number of newly reported cases adjusted by the age distribution of the 1996 Canadian census population per 100,000 population at risk

[4] Test for difference in the age-adjusted rate across geographic areas

Sources:

1). Alberta Health and Wellness. CDRS. November 30, 2002 release

2). Alberta Health and Wellness. The Alberta Stakeholder Registry Population based mid-year population. November 15, 2002 release

Table 18. Rate of Newly Reported HCV Infections by Sex, Year of Reporting, and First Nations Status, Alberta, 1998-2001

Sex	Year of Reporting	Cases by First Nations Status				Rate of Newly Reported Cases				Rate Ratio[4]	
		Yes		No		First Nations		Non-First Nations			
		N	%[1]	N	%[1]	Rate[2]	Adj. Rate[3]	Rate[2]	Adj. Rate[3]	Crude	Adjusted
Males	1998	160	9.7	1,490	90.3	320.4	385.5	103.5	105.2	3.1	3.7
	1999	186	11.6	1,423	88.4	355.0	427.9	97.4	98.0	3.6	4.4
	2000	139	10.8	1,150	89.2	254.8	319.5	77.6	78.0	3.3	4.1
	2001	122	9.4	1,181	90.6	215.8	238.2	78.1	76.5	2.8	3.1
	1998-2001	**607**	**10.4**	**5,244**	**89.6**	**284.4**	**339.2**	**89.0**	**89.4**	**3.2**	**3.8**
Females	1998	180	17.4	852	82.6	357.7	398.0	59.3	60.2	6.0	6.6
	1999	158	17.5	743	82.5	299.3	314.7	51.0	52.1	5.9	6.0
	2000	162	21.1	605	78.9	295.4	323.2	40.9	40.8	7.2	7.9
	2001	107	14.8	614	85.2	188.9	202.9	40.7	39.4	4.6	5.2
	1998-2001	**607**	**17.7**	**2,814**	**82.3**	**282.8**	**306.2**	**47.9**	**48.0**	**5.9**	**6.4**
All Sexes *	1998	340	12.7	2,342	87.3	339.1	392.4	81.5	82.9	4.2	4.7
	1999	344	13.7	2,166	86.3	327.0	371.7	74.2	75.4	4.4	4.9
	2000	301	14.6	1,755	85.4	275.2	323.7	59.3	59.8	4.6	5.4
	2001	229	11.3	1,795	88.7	202.3	227.0	59.5	59.6	3.4	3.8
	1998-2001	**1,214**	**13.1**	**8,058**	**86.9**	**283.6**	**325.3**	**68.4**	**69.3**	**4.1**	**4.7**

Notes:

[1] The proportion of total newly reported cases by First Nations status (row percent).

[2] The number of newly reported cases per 100,000 population at risk.

[3] The number of newly reported cases adjusted by the age distribution of the 1996 Canadian census population per 100,000 population at risk.

[4] The ratio of the rate in the First Nations population over the rate in other Canadians.

* Including 132 cases with sex missing. Excluded 736 (7.2%) cases without data on First Nations status.

** First Nations data were linked from the stakeholder registry and are underestimated.

Sources:

1). Alberta Health and Wellness. CDRS. November 30, 2002 release.

2). Alberta Health and Wellness. The Alberta Stakeholder Registry Population based quarterly population. November 15, 2002 release.

Table 19. Rate of Newly Reported Acute HBV Infections by Sex, Alberta, 1986-2001

Year of Reporting	Males				Females				All Sexes (including sex missing)			
	Reported Cases	% of Sex (row %) [1]	Rate [2]	Age-Adjusted Rate [3]	Reported Cases	% of Sex (row %) [1]	Rate [2]	Age-Adjusted Rate [3]	Annual Total Cases	Cumulative Cases [4]	Rate [2]	Age-Adjusted Rate [3]
1986	131	68.6	10.6	8.2	60	31.4	4.9	3.0	191	191	7.8	5.6
1987	107	60.1	8.6	7.4	71	39.9	5.8	4.7	178	369	7.2	6.0
1988	85	60.7	6.8	5.9	55	39.3	4.4	3.8	140	509	5.6	4.9
1989	75	60.5	5.9	5.2	49	39.5	3.9	3.7	124	633	4.9	4.4
1990	63	59.4	4.9	4.4	43	40.6	3.4	2.9	106	739	4.1	3.6
1991	94	66.2	7.2	6.2	48	33.8	3.7	3.2	142	881	5.4	4.7
1992	106	68.8	8.0	7.4	48	31.2	3.6	3.2	154	1035	5.8	5.3
1993	82	62.6	6.1	5.8	49	37.4	3.7	3.3	131	1166	4.9	4.6
1994	74	62.2	5.5	4.9	45	37.8	3.3	3.0	119	1285	4.4	4.0
1995	59	60.2	4.4	3.9	39	39.8	2.9	2.7	98	1383	3.6	3.3
1996	66	66.7	4.8	4.9	33	33.3	2.4	2.4	99	1482	3.6	3.6
1997	45	58.4	3.2	3.3	32	41.6	2.3	2.3	77	1559	2.8	2.8
1998	68	66.7	4.8	4.7	34	33.3	2.4	2.3	103	1662	3.6	3.5
1999	56	66.7	3.8	4.0	28	33.3	1.9	1.9	85	1747	2.9	3.0
2000	54	80.6	3.6	3.7	13	19.4	0.9	0.9	68	1815	2.3	2.3
2001	54	61.4	3.6	3.6	34	38.6	2.3	2.3	89	1904	2.9	3.0
1986-2001	1219	64.2	5.7	5.2	681	35.8	3.2	2.8	1904		4.4	4.0

Notes:

[1] The proportion of males or females in total cases with known sex.

[2] The number of newly reported cases per 100,000 population at risk.

[3] The number of newly reported cases adjusted by the age distribution of the 1996 Canadian census population per 100,000 population at risk.

[4] The cumulative number of newly reported cases.

Sources: 1). Alberta Health and Wellness. CDRS. November 30, 2002 release.

2). Alberta Health and Wellness. The Alberta Stakeholder Registry Population based mid-year population. November 15, 2002 release.

Table 20. Age-Specific Rate of Newly Reported Acute HBV Infections by Sex, Alberta, 1986-2001

Age at Reporting (year)	Males			Females			All Sexes (including sex missing)		
	Reported Cases	% of Age Group[1]	Rate[2]	Reported Cases	% of Age Group[1]	Rate[2]	Reported Cases	% of Age Group[1]	Rate[2]
0 - 14	22	1.8	0.4	15	2.2	0.3	37	1.9	0.4
15 - 19	56	4.6	3.5	99	14.5	6.5	156	8.2	5.0
20 - 24	173	14.2	10.7	134	19.7	8.2	307	16.1	9.5
25 - 29	217	17.8	12.0	109	16.0	6.0	326	17.1	9.0
30 - 34	217	17.8	11.1	93	13.7	4.8	312	16.4	8.0
35 - 39	159	13.0	8.2	66	9.7	3.5	226	11.9	5.9
40 - 44	109	8.9	6.4	47	6.9	2.9	156	8.2	4.7
45 - 49	55	4.5	4.0	20	2.9	1.5	75	3.9	2.8
50 - 54	45	3.7	4.2	23	3.4	2.2	68	3.6	3.2
55 - 59	31	2.5	3.5	10	1.5	1.2	41	2.2	2.4
60 - 64	21	1.7	2.8	9	1.3	1.2	30	1.6	2.0
65+	34	2.8	1.9	16	2.3	0.7	50	2.6	1.2
Unknown	80			40			120		
All Ages	1,219	100.0	5.6	681	100.0	3.2	1,904	100.0	4.4

Notes:

[1] The proportion of total cases in each age group.

[2] The number of newly reported cases per 100,000 population at risk.

Sources:

1). Alberta Health and Wellness. CDRS. November 30, 2002 release.

2). Alberta Health and Wellness. The Alberta Stakeholder Registry Population based mid-year population. November 15, 2002 release.

Table 21. Rate of Newly Reported Acute HBV Infections by Sex and Geographic Area, Alberta, 1999-2001

Area of Residence	Males						Females						All Sexes (including sex missing)					
	Reported Cases	% of Total (Col. %) [1]	Rate [2]	Adjusted Rate and 95% CI [3]			Reported Cases	% of Total (Col. %) [1]	Rate [2]	Adjusted Rate and 95% CI [3]			Reported Cases	% of Total (Col. %) [1]	Rate [2]	Adjusted Rate and 95% CI [3]		
				Rate	Lower	Upper				Rate	Lower	Upper				Rate	Lower	Upper
Southern Alberta	29	17.7	3.5	3.8	2.4	5.2	15	20.0	1.8	2.0	1.0	3.0	46	19.0	2.7	3.0	2.1	3.9
Calgary Area	48	29.3	3.4	3.3	2.4	4.2	20	26.7	1.4	1.3	0.7	1.9	69	28.5	2.4	2.3	1.8	2.9
Edmonton Area	51	31.1	4.1	4.2	3.1	5.4	27	36.0	2.1	2.2	1.4	3.0	78	32.2	3.1	3.2	2.5	3.9
Northern Alberta	36	22.0	3.7	4.1	2.7	5.4	13	17.3	1.4	1.4	0.6	2.2	49	20.2	2.6	2.7	2.0	3.5
	Differences in rate across area[4]			**p > .05**						**p > .05**						**p > .05**		
Alberta	164	100.0	3.7	3.8	3.2	4.4	75	100.0	1.7	1.7	1.3	2.1	242	100.0	2.7	2.8	2.4	3.1

Notes:

[1] The proportion of total cases per area of the province.

[2] The number of newly reported cases per 100,000 population at risk.

[3] The number of newly reported cases adjusted by the age distribution of the 1996 Canadian census population per 100,000 population at risk.

[4] Test for difference in the age-adjusted rate across geographic areas.

Sources:

1). Alberta Health and Wellness. CDRS. November 30, 2002 release.

2). Alberta Health and Wellness. The Alberta Stakeholder Registry Population based mid-year population. November 15, 2002 release.

Table 22. Rate of Newly Reported Acute HBV Infections by Sex and First Nations Status, Alberta 1998-2001

Sex	Cases by First Nations Status				Rate of Newly Reported Cases				Rate Ratio[4]	
	Yes		No		First Nations		Non-First Nations			
	N	%[1]	N	%[1]	Rate[2]	Adj. Rate[3]	Rate[2]	Adj. Rate[3]	Crude	Adjusted
Males	17	7.6	207	92.4	8.0	8.8	3.5	3.5	2.3	2.5
Females	16	15.4	88	84.6	7.5	7.6	1.5	1.5	5.0	5.1
All Sexes *	33	10.0	297	90.0	7.7	8.2	2.5	2.5	3.1	3.2

Notes:

[1] The proportion of total newly reported cases by First Nations status (row percent).

[2] The number of newly reported cases per 100,000 population at risk.

[3] The number of newly reported cases adjusted by the age distribution of the 1996 Canadian census population per 100,000 population at risk.

[4] The ratio of the rate in the First Nations population over the rate in other Canadians.

* Including two cases with sex missing. Excluding 15 (4.3%) cases without data on First Nations status.

Sources:

1). Alberta Health and Wellness. CDRS. November 30, 2002 release.

2). Alberta Health and Wellness. The Alberta Stakeholder Registry Population based quarterly population. November 15, 2002 release.

Table 23. Number and Proportion of Pregnant Women Who Were Tested for Hepatitis B Surface Antigen, and Hepatitis B Infections in Alberta, Sep. 1998 - Aug. 2002

Time Period	Women Eligible for Testing [1]	Women Tested		HBsAg-Positive	
		N [2]	%	N [3]	Rate [4]
Sep 1998 - Aug 1999	47,606	41,037	86.2	196	5.2
Sep 1999 - Aug 2000	42,522	40,563	95.4	195	5.1
Sep 2000 - Aug 2001	41,026	40,408	98.5	198	5.3
Sep 2001 - Aug 2002	38,988	38,960	99.9	208	5.6
Sep 1998 - Aug 2002	**170,142**	**160,968**	**94.6**	**797**	**5.3**
Chi-square test for linear trend			**$p < 0.001$**		**$p > .05$**

Notes:

[1] Pregnant women receiving prenatal care and registered with the Alberta Health Care Insurance Plan. Each woman was counted only once in a 12 month period.

[2] Pregnant women who received an HBV screening test during the 12 month period. Repeated tests were excluded.

[3] The number of pregnant women confirmed positive for HBV by Provincial Lab for Public Health and/or with a HBV case report. Cases who were reported in previous pregnancies were included.

[4] The number of pregnant women with confirmed HBsAg positive (new or old) per 1,000 liveborns in Alberta.

Sources:

1) Provincial Lab for Public Health. Alberta Routine Prenatal HBV Screening Program.October 2002 release
2) Canadian Blood Services (CBS). Alberta Routine Prenatal Care Blood Testing Database. Oct. 2002 release.
3) Alberta Health and Wellness. CDRS. November 2002 release

Table 24. Co-Infections in Newly Reported HIV/AIDS, HCV, and Acute HBV Infections by Year of Reporting, Alberta, 1998*-2001

Co-infection	Year of Reporting	Reported	Co-Infection at Reporting		Co-Infection after Reporting	
		Cases	N[1]	%[2]	N[3]	%[4]
HIV/AIDS with HCV	1998	132	18	13.6	6	1.5
	1999	188	33	17.6	3	0.8
	2000	207	50	24.2	1	0.5
	2001	184	39	21.2	0	0.0
	1998-2001	**711**	**140**	**19.7**	**10**	**1.4**
HCV with HIV/AIDS	1998	2,933	18	0.6	15	0.2
	1999	2,653	29	1.1	21	0.4
	2000	2,216	35	1.6	9	0.4
	2001	2,191	23	1.0	0	0.0
	1998-2001	**9,993**	**105**	**1.1**	**45**	**0.5**
Acute HBV with HCV	1998	102	20	19.6	6	2.0
	1999	84	21	25.0	1	0.6
	2000	68	13	19.1	1	1.5
	2001	89	21	23.6	0	0.0
	1998-2001	**343**	**75**	**21.9**	**8**	**2.3**

There were three cases with three-way co-infection (HBV+HCV+HIV).

Notes:

[1] The cumulative number of newly reported cases co-infected with a given blood-borne pathogen infection of interest at year of reporting.

[2] The proportion of cumulatively co-infected cases in newly reported cases at year of reporting.

[3] The number of newly reported cases co-infected with a given blood-borne pathogen infection of interest after the year of reporting.

[4] The average annual proportion of co-infected cases with a given blood-borne pathogen infection of interest after the year of reporting.

*HIV became reportable as of May 1998, so 1998 data may be incomplete.

Source: Alberta Health and Wellness. CDRS. November 30, 2002 release.

Table 25. Newly Reported HIV/AIDS Cases with HCV Co-Infection by Exposure Category, Alberta, 1998*-2001

Co-infection	Exposure category	Co-infected group			Non co-infected group			Ratio[4]	*p* value[5]
		N[1]	%(col.)[2]	%(row)[3]	N[1]	%(col.)[2]	%(row) 3		
HIV/AIDS with HCV	MSM	2	1.3	1.1	181	32.3	98.9	0.04	< 0.001
	IDU	129	86.0	43.1	170	30.3	56.9	2.84	
	Heterosexual contact	19	12.7	8.8	196	34.9	91.2	0.36	
	Other	0	0.0	0.0	13	2.3	100.0	0.00	
	Unknown	0	0.0	0.0	1	0.2	100.0	0.00	
	Total	150	100.0	21.1	561	100.0	78.9		

Note:

[1] The cumulative number of newly reported cases co-infected with a given blood-borne pathogen infection of interest in 1998-2001.

[2] The proportion of an exposure category in co-infected or non co-infected group (column percent), 1998-2001.

[3] The proportion of co-infected cases and non co-infected cases within an exposure category (row percent), 1998-2001.

[4] The ratio of the proportion in the co-infected group to the proportion in the non co-infected group, for each exposure category.

[5] Chi-square test for the difference in the proportion of co-infection across exposure categories.

*HIV became reportable as of May 1998, so 1998 data may be incomplete.

Source:

1) Alberta Health and Wellness. CDRS. November 30, 2002 release.

2) Alberta Health and Wellness. The AHCIP Stakeholder Registry. November 30, 2002 release.

Table 26. Co-Infections in Newly Reported HIV/AIDS, HCV, and Acute HBV Infections by Aboriginal Ethnicity/First Nations Status, Alberta, 1998*-2001

Co-infection	Aboriginal / First Nations[1]	Co-infected group			Non co-infected group			Odds Ratio (OR) (95%CI)	*p* value[5]
		N[2]	%(col.)[3]	%(row)[4]	N	%(col.)[3]	%(row)[4]		
HIV/AIDS with HCV	Yes	71	47.3	35.9	127	22.6	64.1	3.07 (2.11-4.48)	< 0.001
	No	79	52.7	15.4	434	77.4	84.6		
	Total	150	100.0	21.1	561	100.0	78.9		
HCV with HIV/AIDS	Yes	71	47.3	5.9	1136	11.6	94.1	6.88 (4.96-9.53)	< 0.001
	No	79	52.7	0.9	8694	88.4	99.1		
	Total	150	100.0	1.5	9830	100.0	98.5		
Acute HBV with HCV	Yes	17	21.8	50.0	17	6.9	50.0	3.79 (1.83-7.85)	< 0.001
	No	61	78.2	20.9	231	93.1	79.1		
	Total	78	100.0	23.9	248	100.0	76.1		

Note:

Comparison was limited to cases with known Aboriginal/First Nations status.

[1] An individual who was reported as an Aboriginal in the Health Canada HIV/AIDS case report or who had First Nations status in the AHCIP stakeholder registry at the time of registration.

[2] The cumulative number of newly reported cases co-infected with a given blood-borne pathogen infection of interest by Aboriginal/First Nations status, 1998-2001.

[3] The proportion of Aboriginals or First Nations individuals in co-infected and non co-infected groups of a given blood-borne pathogen infection in 1998-2001 (column percent).

[4] The proportion of co-infected and non co-infected cases of a given blood-borne pathogen infection by Aboriginal/First Nations status, 1998-2001 (row percent).

[5] Chi-square test for the difference in the proportion of co-infection between Aboriginal/First Nations and Non-Aboriginal/First Nations.

*HIV became reportable as of May 1998, so 1998 data may be incomplete.

Source:

1) Alberta Health and Wellness. CDRS. November 30, 2002 release.

2) Alberta Health and Wellness. The AHCIP Stakeholder Registry. November 30, 2002 release.